

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXXI.

August 4, 1934

No. 788

Notes and Comments

Accidents in Industry

SOME general impressions formed during his two years' tenure of office are given by Mr. D. R. Wilson, Chief Inspector of Factories and Workshops, in his annual report for 1933, just issued. In his opinion the chief hindrance to the avoidance of accidents is not want of knowledge of the factors constituting danger, but want of appreciation on the part of those exposed to risk, combined with indifference on the part of a small fraction of employers. An industrial disease, on the other hand, is a condition of which the symptoms may not be immediately apparent and the primary cause may remain long unsuspected. The existence of asbestosis, for instance, was for many years unrealised. During the year several new problems have arisen. An investigation into the incidence of silicosis among sand-blasters has established the fact that sand-blasting with the use of sand is an extremely dangerous occupation. Fortunately a remedy is at hand in the use of other abrasives. A series of deaths due to the inhalation of vapour of diethylene dioxide (dioxan) at an artificial silk works was followed by an inquiry into the extent to which this substance is in industrial use. The result was negative and the present position as regards this particular substance is therefore reassuring in view of the public warning afforded. This occurrence, however, raises a question of wide importance. There is at present no clear relation between toxicity and chemical constitution, and having regard to the increasing use of new organic compounds as solvents, it would seem that a very valuable safeguard would be to arrange for each to be physiologically tested before it is placed on the market for general use. In accordance with a decision reached more than a year ago the Imperial Chemical Industries, Ltd., have now taken steps for this to be done.

At the end of the year there were 160,185 factories and 86,851 workshops on the registers of the Department, an increase of 2,294 factories and a decrease of 4,008 workshops compared with the preceding year. The number of premises of all kinds subject to inspection was 285,284. The number of accidents reported showed an increase from 106,164 to 113,260 and of fatal accidents from 602 to 688. Two reasons for these increases are suggested by Mr. W. B. Lauder, the superintending inspector. There is, first, the improvement in trade and the increase in the number of workers employed. Probably also the increase is due, in part, to other and altogether exceptional factors.

Workers are returning to employment often after long periods of enforced unemployment. Many of them are suffering from lack of nourishment, and physically and mentally are less alert and more liable to mishap than in normal times. Again, there is evidence that on restarting work after a long spell of idleness some workers tend to over-exert their strength and energy, while others take some time to get accustomed to working conditions again. All these factors have to be taken into account, although it is also true that machinery is more efficiently fenced, plant of all kinds more safely constructed, welfare and working conditions of a much higher standard, and more precautions are taken by employers and workers alike than at any time in our industrial history.

Ionised Oils

TESTS by the Wool Industries Research Association have proved that a new process for the preparation of ionised oils shows considerable advance on current practice and it is announced that a large factory capable of producing these oils on a commercial scale has been opened near London. The new method can be commercially applied to almost any oil, including ground nut, soya bean, cod, palm kernel, or even mutton tallow. Oils so treated are non-oxidising and have extraordinary bleaching and softening powers. The present practice with raw wool is first to scour it with alkali, then process or soften it with olive oil, and then again to scour it to remove the oil. The new ionised oils will both scour and process, and the surplus oil can then be removed by merely washing in water. In the course of the research work it was discovered that these oils could be used to treat coir, sisal, hemp, jute, flax, and many other vegetable fibres which, under existing methods, required months of slow extraction or very expensive mechanical appliances, and even then were unsuitable for fine spinning.

The oils possess valuable antiseptic and bactericidal qualities. Arrangements are being made to market them in different forms as toilet preparations, shampoos, sheep dips, and agricultural fungicides. They can be used in ordinary laundry work instead of soap with greatly improved results. Clothes become much whiter, and flannels particularly do not "yellow" or become hard, as they do with soap. By-products of the various processes are equally valuable. Lanoline is recovered in quantity from the oils used for wool scouring. A plastic substance capable of a great variety of finish and uses, is produced from vegetable

fibre waste. A resilient, tough floor covering has been made from residues of coir and sisal that at present are thrown away. This material is also of great efficiency as an insulator of heat, sound, and electricity. It is waterproof and non-inflammable. The waste tow from sisal disintegration has been found to produce an antiseptic wool more absorbent and much cheaper than ordinary cotton wool. Waste coir reduced to powder can be used as a body filler for paints and enamels. The invention contains great possibilities for Empire products at present more or less useless. Although the factory is now beginning production of the numerous types of ionised oils, research work is still being pursued, and new uses for the various by-products continue to be discovered.

Production of Cancer by Chemicals

DR. S. H. BADOCK, the Pro-Chancellor of Bristol University, in addressing the recent Health Congress of the Royal Sanitary Institute at Bristol, discussed the possible connection between tar-sprayed roads and cancer of the lung—a disease which has increased to a marked extent during the past twenty years. For many years coal tar has been recognised as a carcinogenic agent, so it is not improbable that the tar-laden dust which is raised by quick-moving vehicles is largely responsible for cancer of the lung. At any rate, Dr. Badock's plea for an examination of the problem cannot be ignored, particularly in view of the researches of Professor Kennaway and his colleagues, who have shown that certain constituents of coal tar, notably 1:2-benzpyrene, are extraordinarily potent carcinogenic agents. Whether the dust from tar-sprayed roads induces cancer by virtue of its irritant properties is a moot point, since many of the irritant constituents of tar, including the phenolic bodies, yield negative results in experimental carcinogenesis. On the other hand, all the known cancer-producing hydrocarbons fail to irritate the human skin. In the face of this evidence it is not improbable that there is a relation between chemical constitution and carcinogenic activity; in fact, the researches of Professor Kennaway and his co-workers indicate that the property of cancer production by chemical substances is dependent on a particular type of molecular arrangement, and that a factor which is common to all the carcinogenic hydrocarbons is the presence of the phenanthrene ring-system. Since the sterols, which are constituents of every normal cell, contain this ring-system, the possibility of their being transformed into carcinogenic agents by means of abnormal metabolic processes is not being ignored.

Dyes and Dermatitis

DECISIONS have been given in the courts from time to time on claims for damages based on allegations that dyed textiles have been the cause of certain forms of skin irritation, and it is therefore not surprising that dyestuffs makers and users should have decided that the time has arrived for combined action. An expert committee has been formed as a result of a meeting of the leading firms in the industry, to investigate the whole question. Sir Henry Sutcliffe Smith, in his presidential speech to the Colour Users' Association in Manchester last week, said there was little definite to report from the committee as yet, but it

would appear that the question is one which is independent of the quality of the colours, or of the dyeing, or even of the quality of the material itself, but is rather one of an unfortunate and but vaguely understood predisposition of certain rare individuals to particular influences or conditions. The whole subject is anything but simple, but Sir Henry is hoping, as a result of the work of this committee, that the present unsatisfactory position will be cleared up.

Both the dye-maker and the dye-user feel that they are being put in an unfair position because medical opinion on the subject is still in a state of flux owing to the complexity of the problem. It has been known for years, for example, that there are people who cannot eat strawberries or eggs without suffering ill effects, but that condition is accepted by the individual concerned, who would not think of bringing an action for damages against a supplier of these commodities. The fact that one garment out of ten thousand made from the same fabric is the subject of a complaint due to the hyper-sensitiveness of an individual should be viewed in exactly the same way as cases in which a particular food produces similar or unusual reaction. In Sir Henry's opinion there is no reason why the supplier of textiles should be held liable any more than the purveyor of foodstuffs.

Socialistic Legislation

APART from the waste of time involved in the passage of the Search for Oil Bill, to which we referred last week, our objection to it is the creation of precedent. It has been a principle of English Law that the landowner has rights over his minerals. Those rights may vary in different localities and in different estates according to the history of the land. No doubt they are sometimes an impediment to development; but in many instances it has been through the initiative of the landowner that mining has been commenced and new industries have been initiated. There are to-day very few landowners who would object to increasing their incomes by developing any mineral rights that might lie beneath their land. Not unnaturally they expect to secure sufficient profits to compensate them for spoiling the country over which they may farm or indulge in other activities. Nationalisation of mineral rights is one of the tenets of the socialist.

We are not surprised to hear that "with the exception of one or two phrases . . . the Opposition are in entire agreement." Does not the Bill lay open to attack all the minerals—whether fuel or chemical—which lie under the surface of the country with resulting exploitation by any outsider who cares nothing for the wishes of the residents and who rarely comes nearer to his works than the financial quarter of the City of London? This Bill appears to us to foreshadow in some future Parliament socialistic legislation which will be detrimental alike to industry and to the individual. In the debate it was held by some that "the Government realised that they were nationalising petroleum and confiscating the property of the people." There can be little doubt that the measure is far from receiving general support from Government supporters, however much the Opposition may like it; and, in view of the unnecessary character of the legislation, in our view much of the Bill should not be proceeded with.

The Colour Users' Association

Sir Henry Sutcliffe Smith

Reviews the Work of the Past Year

Sir Henry Sutcliffe Smith delivered a speech of considerable importance to the textile trade at the annual meeting of the Colour Users' Association, of which he is chairman, at Manchester on July 27. A summary of his speech is given below.



Sir Henry Sutcliffe Smith.

SIR HENRY SUTCLIFFE SMITH, in moving the adoption of the report and accounts of the Association, for the year ended April 30, 1934, said it was since the last annual meeting of the Association that the Dyestuffs (Import Regulation) Act, 1920, has been amended in certain particulars and has now become a permanent Act. During the year the Association has lost through death two most valuable members, Mr. William Watson and Mr. T. R. Fothergill, both of whom had earned the respect and esteem of all their colleagues on the council, and just recently another member of the council, Mr. Harry Jennings, had died. Two members—Mr. James Ewing and Mr. C. C. Railton—had found it necessary to resign from the council owing to pressure of other business.

Referring to the work of the British Colour Council, Sir Henry congratulated this council on the completion of their Dictionary of Colour Standards. The standard card shows 220 colours named, numbered and coded, while a companion dictionary gives the history of the colours and the authority for standardisation. The various names by which the different colours have been known are also given in the dictionary, and there are also colour readings and measurements, etc., for the special benefit of those who require the colours measured scientifically. He appealed to all members of the Colour Users' Association to become members and support the work of the British Colour Council, which has universal interest and is conducted not for profit but entirely for the benefit of industry and the public.

British-Produced Benzol

As on the occasion of previous meetings, Sir Henry again referred to the question of the price charged to the dye-making industry of this country for British-produced benzol, stressing the importance of a cheap supply of this commodity, which vitally affects the cost of aniline oil and many of our dyestuffs. Owing to the operation of the Excise Duty placed upon motor spirit imported into the United Kingdom, the price of benzol in this market had been increased by about 8d. per gallon over and above the figure which would normally be charged had no duty been imposed. When this duty was introduced it was primarily intended for revenue purposes and expected to be borne by the motoring community, but as the demand from the latter exceeds the available supply of home produced fuel, the British benzol distillers have quite naturally taken advantage of the situation and charged

to the dyemakers a price equivalent to what they can obtain in the open market for their production. During the past year strenuous efforts have therefore been made by the dye-making, dye-using, and general chemical industries, by approaching the benzol manufacturers and the Board of Trade, to try and obtain some relief from the onerous effect of the tax, and negotiations are still proceeding with a view of attaining that object. The current price for pure benzol in the United States is about 19/20 cents per American gallon, which is roughly half the current price in this country, so it will be readily seen that the British dye manufacturers are at a great disadvantage, as compared with their American competitors, in the manufacture of those products in which benzol is used.

Having regard to the recent shortage of coal tar phenol, attention might also be directed to the possibility of producing synthetic phenol. This alternative source of an important intermediate is contingent on a supply of cheap benzol. Home producers of synthetic phenol should not be placed in an unduly disadvantageous position in respect of cheap benzol which will undoubtedly be available to their foreign competitors.

British Dyestuffs Production

As seen from the table on page 98, the total production of the British dyestuffs industry in 1933 exceeded the previous year's figures by over 7 per cent., whilst as compared with 1930 there is an advance of nearly 25 per cent., a very clear indication of the consolidation of the British industry and a reflection of their achievements in research and adaptability. Although there does not appear to have been any outstanding discovery in the manufacture of dyewares during the last year, except perhaps the placing on the market by the Imperial Chemical Industries, Ltd., of Dispersol Fast Blue GS, which represents the first satisfactory discharge blue for acetate rayon, there has been gradual progress in the quality and range of the British productions, L. B. Holliday and Co., Ltd., for instance, having introduced several dyewares not previously made here. Considerable progress has also been made in the manufacture of auxiliary chemicals which are now of great importance to the using trades. These latter developments include scouring assistants and detergents, wetting, penetrating, emulsifying and softening agents, and other chemicals for which some quite novel uses have been discovered; for instance, an agent in-

troduced by the Imperial Chemical Industries renders it possible to strip goods dyed with naphthols and vat dyes, which are normally very difficult to remove from the fibre. The chemistry of the new assistants is very complex, but one general tendency is markedly in evidence, *viz.*, a combination of organic chemistry with the latest ideas of modern physical chemistry.

British Dyestuffs Exports

The weight of dyestuffs and intermediates exported in 1933 was lower than it has been for some years past, but the value almost equalled the levels set in 1931 and 1932. The following table shows the weight and value of the exports each year from 1925, as compared with 1913:—

| Year. | Weight, Tons. | Value, £ |
|--------------|------------------|-------------|
| 1913 | 2,434 | 177,246 |
| 1925 | 5,208 | 847,639 |
| 1926 | 3,793 | 614,419 |
| 1927 | 3,882 | 658,464 |
| 1928 | 5,199 | 806,533 |
| 1929 | 7,844 | 984,222 |
| 1930 | 5,306 | 878,968 |
| 1931 | 5,864 | 1,016,238 |
| 1932 | 5,739 | 1,038,288 |
| 1933 | 4,832 | 991,616 |

From this table it will be noted that there was a decrease last year of nearly 16 per cent. in weight compared with 1932, but the decrease in value was less than 5 per cent. It would thus appear that the exports during 1933 consisted of higher priced dyestuffs and I am informed that this is substantially correct, as in certain foreign markets—particularly India and China—there is a tendency to use better class colours, many of which are exported in a highly concentrated form. In addition, it may be mentioned that exports are governed to some extent by the stock position abroad and I find that an appreciable weight of the exports in 1932 did not go into consumption until the following year, resulting in a proportional decrease in 1933.

Dyestuffs Advisory Licensing Committee

The number of licence applications dealt with by the Dyestuffs Advisory Licensing Committee was considerably in excess of the previous year. In 1933 these aggregated 7,705, as compared with 5,479 in 1932, an increase of 41 per cent., and it is pleasing to note the expeditious manner in which these applications received attention, no less than 97 per cent. being dealt with within four days of receipt. It is also interesting to note that, although there was this large percentage increase in the number of applications, the weight licensed represented only a 7 per cent. increase.

As the Licensing Committee had to be reconstituted owing to the introduction of the new Act, it was felt that the five representatives of the users on this committee should be nominated by the Association, particularly in view of the repeated assertions by the Government that the users had a majority on the committee. Eventually the Board of Trade decided that the Colour Users' Association should nominate four of the five users' representatives, and that the fifth should be nominated by the British Colour Makers' Association, which is composed of firms using dyewares for the production of lakes and pigments necessary for the manufacture of paints, printing inks, linoleum, wallpaper, etc. Messrs. N. G. McCulloch, C. M. Whittaker, P. Caldwell and myself were elected to represent the users on this committee, and Mr. G. E. Holden was asked to continue his valuable services as the Association's honorary technical adviser.

Dyestuffs Prices

In reviewing the general position in relation to dyestuffs prices, Sir Henry drew attention once more to the great disparity existing between the dyestuffs index figure of approximately 200 and the Board of Trade wholesale commodity figure for June of 103.6. He said he did not know of any other industry where selling prices are fixed on a level approximately 100 per cent. higher than they were in 1913, and notwithstanding the appeals and protests which have been made from time to time the dyemakers show no inclination to depart from the higher price levels established by them

at the beginning of 1932 when the International Cartel came into being. The consolidation of dyeware prices on higher levels and the success achieved by the makers in maintaining these levels during a period of serious depression in the textile trades and whilst prices for bleaching, dyeing, and printing have been falling all the time, does not seem to be the best way to help towards the restoration of our industrial prosperity.

This question of dyestuff prices is of vital importance to the textile trade in its struggle against the intense competition of cheap foreign productions, when every item in its manufacturing costs demands the keenest scrutiny and the exercise of rigorous economy if even our present low level of exports and unsatisfactory domestic trade are to be maintained. The severity of the competition is intensified by the reduced volume of business available, and the dyemakers should make some determined efforts to offer their wares at much lower prices to the consuming industries. Last year the Association of British Chemical Manufacturers undertook to sell their dyewares at a world's price, but it is really impossible to ascertain what the world's prices are, as foreign makers, owing to the Cartel agreement, still refuse to quote for dyewares made in this country.

Dyestuffs (Import Regulation) Act

The report of the Import Duties Advisory Committee, dated July 10, 1933, was presented to Parliament on September 7, 1933 (Cmd. 4411) and the Committee recommended (a) that the Act prohibiting the importation of dyestuffs except under licence should be continued without any time limit; (b) that dyestuffs admitted under licence should be free of import duties; (c) that intermediate products should still remain subject to the 10 per cent. duty; (d) that the dyestuffs Industry Development Committee should be incorporated with the Dyestuffs Advisory Licensing Committee; (e) that an Appeal Board should be formed in case of any complaint of exploitation in respect of dyestuffs, intermediates, etc., and the Import Duties Advisory Committee were prepared to undertake this task; and (f) that a Joint Standing Committee of Makers and Users should act as a consultative body on questions relating to prices and supplies. This report was considered by the Council of the Colour Users' Association at its meeting on October 6, 1933, when it was decided to ask the Publicity and Statistics Committee to draft a considered statement of the Association's views on these recommendations.

In the House of Commons on November 8, 1933, the Parliamentary Secretary to the Board of Trade (Dr. E. L. Burgin) announced that the Government had decided to adopt the recommendations of the Import Duties Advisory Committee and a Bill to give effect to these recommendations would be introduced in the next session. In the meantime, the Dyestuffs (Import Regulation) Act, 1920, would be renewed under the Expiring Laws Continuance Bill. On December 13, 1933, the President of the Board of Trade formally introduced to the House of Commons the Government's Bill "to amend and make permanent the Dyestuffs (Import Regulation) Act, 1920," and it was read a first time.

Restrictions on Dyestuff Supplies

On December 16, the Council sent a memorandum to the Board of Trade regretting that the Import Duties Advisory Committee had not suggested the removal of all restrictions on dyestuff supplies and stating that the procedure outlined would not be likely to remove the disabilities under which colour using firms suffered. Approval was, however, expressed of the proposal to place all dyestuffs on the Free List, and it was suggested that all intermediates used as dyestuffs for textile bleaching, dyeing, or printing should be added to this list. It was also asked that the removal of the import duty on dyestuffs should take effect from January 1, 1934. The Association desired in addition that they should have an opportunity of making suggestions for nominations for any committees in which their interests were affected, and in conclusion "promised to use every endeavour to assist in the smooth working of the Act."

The second reading of the Dyestuffs (Import Regulation) Bill, moved by Dr. Burgin, took place on December 18, 1933, and after a most interesting debate the motion was carried by 245 to 72 votes. Dr. Burgin stated that the Treasury

would issue Orders bringing into effect the tariff changes recommended by the Import Duties Advisory Committee and that these changes would come into force on December 27, 1933. He also stated that the Joint Committee of Makers and Users to be appointed by the bodies representing these interests to consider questions relating to prices and supplies would be set up early in the New Year. The third reading of the Bill took place on March 5, 1934, when it was passed by 193 votes to 38.

One of the main points put forward by Dr. Burgin in sponsoring the Bill was that arrangements should be made to remove users' anxiety of exploitation, and he referred particularly to the fact that the Import Duties Advisory Committee had suggested that an independent authority should have the power of investigation as to complaints by a responsible body of consumers, and that they had intimated their willingness to accept this responsibility.

The Dyestuffs Bill thus having become law, licences for the importation of dyestuffs have to be applied for to the Dyestuffs Advisory Licensing Committee as heretofore. The latter committee is being reconstituted, owing to the recommendation of the Import Duties Advisory Committee that the Dyestuffs Industry Development Committee should be incorporated with it. The Import Duties Advisory Committee will now be a reference body to whom colour users can appeal if they feel they are not being fairly dealt with or are being exploited in any way. As the Government had adopted the suggestion made by the Import Duties Advisory Committee that a small committee of makers and users should be formed for the purpose of discussing such subjects as prices and supplies, it was agreed that three on either side would be a suitable number and the Council accordingly nominated Mr. N. G. McCulloch, Mr. C. M. Whittaker and Sir Henry Sutcliffe Smith to be the members of this Committee, and the makers at the same time nominated Mr. W. J. U. Woolcock, Major L. B. Holliday and Mr. D. R. Mackay to be their representatives.

Tariff on Intermediates

It is most unsatisfactory to users, continued Sir Henry, that intermediate products used solely for textile bleaching, dyeing and printing purposes and not used by these trades in any way for the making of dyestuffs are still subject to the 10 per cent. tariff. The contention of the users is that, as the Import Duties Advisory Committee have recognised the justice of the Association's claim that dyestuffs, when licensed, should come into this country free of duty, it is anomalous that any wares—no matter by what names they are known—which are used for textile bleaching, dyeing or printing purposes, should still be subject to the 10 per cent. duty.

The Colour Users' Association therefore suggested to the Board of Trade that these particular intermediates used as dyewares should be added to the Free List. Eventually it was decided to appoint a deputation to interview the Board of Trade on this question and Messrs. C. C. Railton, F. O. Ashmore, C. M. Whittaker, G. E. Holden and Sir Henry Sutcliffe Smith, with power to co-opt, were asked to form the deputation. At the same time a sub-committee was asked to prepare a case on this subject to be placed before the House of Commons Standing Committee "A" who were considering the Dyestuffs Act. On January 31, 1934, this deputation interviewed the Board of Trade and presented their case for the rescission of the duty. After a long discussion the deputation then called upon the Import Duties Advisory Committee and were recommended to put in an application for the types of intermediates used as dyewares to be excluded from the 10 per cent. tariff.

As a result of this interview, the Association decided to apply to the Import Duties Advisory Committee for the inclusion of certain materials in the Free List, *viz.*: "Synthetic organic products which are subject to the provisions of the Import Duties Act (1932) and the Dyestuffs (Import Regulation) Act, and whose application (alone or in combination) to textile materials results in the production "in situ" of a dyestuff. Examples falling within this definition are Rapid Fastcolours, Rapidogenes, Rapidazols, Naphthol AS series, and fast colour bases and salts." A letter was accordingly sent on February 5, 1934, to the committee in conformity with this decision.

On February 10, 1934, a special circular was addressed by the Association to all members of Standing Committee "A" which was considering the Dyestuffs Bill, drawing their attention to the position and asking for their support in removing the disability of the 10 per cent. tariff on intermediates used as dyewares. The definition of intermediates given on February 5 was subsequently modified as follows: "Synthetic organic intermediate products which are used by textile dyers and printers for the production of dyestuffs on the fibre."

The Problem of a Definition

On February 13, 1934, the Association was asked if they would submit a detailed application and this was immediately sent. The information was drawn up in such a manner as to enable the Import Duties Advisory Committee to appreciate the extreme importance to the textile trade of the materials which might be included under the description of intermediates. The Association was then advised that in accordance with the Import Duties Advisory Committee's usual practice, the application would be advertised in the Press, the "Board of Trade Journal," and the trade journals concerned, in order that interested parties might have an opportunity of making representations thereon. On March 12, however, the Import Duties Advisory Committee stated they could not accept the wide definition given in the original application and asked for a list of specific products, which would then be communicated to the Association of British Chemical Manufacturers, representing the dyestuff makers, for consideration. It was then proposed in due course to convene a meeting representative of both interested parties. The Association, however, on April 13, still urged the Import Duties Advisory Committee to find means for dealing with this matter on general lines rather than by the preparation of lists, and desired a reconsideration of the application. Simultaneously the Association took the opportunity of pointing out to the Board of Trade that a certain number of dyewares, such as Rapid Fast colours, Rapidogenes, and Rapidazols, were wrongly classified as intermediates and should be classified as dyestuffs.

Following this the Import Duties Advisory Committee requested Sir Allan Powell, one of their members, to hold a joint meeting of representatives of the Colour Users' Association and of the Association of British Chemical Manufacturers, to discuss our application. This meeting took place at the offices of the Import Duties Advisory Committee on May 7, 1934, when the Colour Users' deputation consisted of Mr. N. G. McCulloch, Mr. C. M. Whittaker, Mr. F. O. Ashmore, Mr. G. E. Holden and Sir Henry Sutcliffe Smith. At this meeting the makers objected to the covering clause: "Synthetic organic intermediate products which are used by textile dyers and printers for the production of dyestuffs on the fibre," as they stated this left room for a good deal of misinterpretation. Eventually Sir Allan Powell suggested that the standing joint committee set up under the recommendation of the Import Duties Advisory Committee, consisting of three representatives on each side of makers and users, should meet and try to hammer out an agreed definition. If this could be done and an agreement arrived at, it was felt there would be little difficulty in having the recommendation favourably reported upon to the Government.

A New Suggestion

As a result of Sir Allan Powell's suggestion, a meeting of the standing joint committee was held on June 4, 1934, and several suggestions were made to get over the difficulty, but again a solution satisfactory to both parties was not attained. However, a suggestion has been made recently by the Association and submitted to the makers' representatives on the standing joint committee for consideration, which it is hoped will form a basis on which agreement can be arrived at in order that a joint recommendation shall be made to the Import Duties Advisory Committee.

Mr. N. G. McCulloch, in seconding the adoption of the report and accounts, desired to express the opinion that the chairman's address had covered the ground extremely well. He was very pleased to note that the chairman had made it

PRODUCTION OF SYNTHETIC DYESTUFFS IN THE UNITED KINGDOM.

| Year. | Direct Cotton. | Acid Wool. | Chrome & Mordant (including Alizarine). | Basic. | Sulphur. | Vat (including Indigo). | Dyestuffs for Lake Making. | Cellulose Acetate Silk Dyestuffs. | Oil, Spirit and Wax and Miscellaneous. | Aggregate Total. | Index Figure. |
|-------|----------------|------------|---|-----------|-----------|-------------------------|----------------------------|-----------------------------------|--|------------------|---------------|
| | lb. | lb. | lb. | lb. | lb. | lb. | lb. | lb. | lb. | lb. | |
| 1913 | 1,680,671 | 631,195 | 4,315,933 | 311,661 | 1,928,493 | — | 6,927 | — | 239,254 | 9,114,134 | 100 |
| 1922 | 2,726,290 | 4,188,786 | 4,927,822 | 917,946 | 5,865,769 | 1,369,513 | 478,925 | — | 3,357,916 | 23,832,967 | 261 |
| 1923 | 4,411,878 | 4,813,620 | 7,744,110 | 1,367,754 | 7,739,182 | 5,398,634 | 807,811 | — | 817,730 | 33,100,719 | 363 |
| 1924 | 5,059,084 | 5,192,474 | 6,940,263 | 1,561,400 | 7,832,909 | 5,003,713 | 754,466 | — | 898,395 | 3,324,704 | 365 |
| 1925 | 4,940,838 | 4,498,653 | 6,256,276 | 1,710,556 | 6,225,791 | 7,295,769 | 1,014,334 | — | 751,185 | 32,693,402 | 359 |
| 1926 | 4,180,508 | 5,217,259 | 6,972,112 | 1,308,813 | 4,636,930 | 6,237,703 | 947,933 | — | 795,742 | 30,297,000 | 332 |
| 1927 | 5,615,607 | 6,233,179 | 7,502,229 | 2,014,806 | 7,117,233 | 8,818,923 | 1,138,375 | — | 1,111,404 | 39,551,756 | 434 |
| 1928 | 7,117,283 | 7,848,509 | 8,431,430 | 2,688,450 | 7,266,263 | 11,042,908 | 1,388,925 | 227,501 | 4,949,203 | 50,960,472 | 559 |
| 1929 | 7,388,725 | 7,425,330 | 9,614,734 | 2,551,137 | 6,864,243 | 14,683,701 | 1,862,868 | 774,803 | 4,619,491 | 55,785,032 | 612 |
| 1930 | 6,716,291 | 6,449,530 | 6,878,865 | 2,367,547 | 5,231,954 | 9,068,263 | 1,345,897 | 1,033,383 | 3,498,513 | 42,590,243 | 467 |
| 1931 | 7,832,344 | 8,193,316 | 6,920,241 | 2,404,402 | 7,680,841 | 8,892,730 | 1,460,785 | 921,929 | 4,314,485 | 48,621,073 | 533 |
| 1932 | 7,581,162 | 9,377,931 | 6,568,683 | 2,899,150 | 7,602,416 | 7,482,154 | 1,735,901 | 1,265,775 | 4,867,094 | 49,380,266 | 542 |
| 1933 | 8,820,373 | 10,077,272 | 7,486,675 | 3,142,945 | 7,867,600 | 7,322,726 | 1,861,924 | 1,658,035 | 4,707,316 | 52,944,866 | 581 |

Previous to 1928 the production figures for cellulose acetate silk dyestuffs were included with the figures for "oil, spirit and wax and miscellaneous dyestuffs."

quite clear that though the Association had pledged itself "to use every endeavour to assist in the smooth working of the Act," yet it had been made clear in the address that colour users would still suffer disadvantages under the Act which, unfortunately, had now been made permanent. As the chairman had remarked, it was not possible to determine a world-price. The safeguards which had been laid down were largely illusory. By the action of the Act the real benefits of competition had been lost, and colour users would be compelled to purchase where they were told to buy and at the price which they were told to pay; while their own products had to be sold in the open market and would be subject to the fiercest competition. One illustration of the difficulties under which they would have to labour was with regard to the question of intermediates. They were still paying the 10 per cent. duty, as would be gathered from listening to the chairman's survey of the efforts which had been made to free them from it. After some seven months interval no agreement had been arrived at as to elucidation of the difficulty. This illustrated very well the cumbersome machinery under which colour users had to operate.

Mr. H. BLACKBURN supported the resolution from the point of view of a wool dyer associated with a private firm. He was pleased to find the chairman making reference to the Society of Dyers and Colourists, and to the fact that that Society was dealing with the problem of fastness to light of dyes. Personally, he was exceedingly interested in the exposure of dyes to light. He was prepared to maintain that it was very little use exposing dyes to light without concentrating on the exposure of the dyes in light in small percentages. Sometimes dyes were fast in a dark shade, but in order to get the best results there must not be dyeing of more than $\frac{1}{2}$ per cent. to 1 per cent. If the dyes were fast in the light shades then it would follow that they would be fast in the dark shades. With regard to the question of dyestuffs generally, he was of opinion that this country had made very desirable progress both in regard to the quantity produced and the quality of dyes. The only point, he thought, which could be legitimately criticised was the ratio of price to-day as compared with the price pre-war. There was considerable room for improvement in that respect.

The resolution was then put to the meeting and carried unanimously.

Members of the Council

The following members of the Council were elected for the current year:—

Members elected by Amalgamated Companies under Rule 37 (a). Bleachers' Association, Ltd.: E. Carr Deakin. Bradford Dyers' Association, Ltd.: Sir Henry Sutcliffe Smith; Harry Martindale; Thorp Whitaker. British Cotton and Wool Dyers' Association, Ltd.: C. Rawson; P. Caldwell; E. T. Holdsworth. Calico Printers' Association, Ltd.: Forrest Hewitt; W. E. Kay; N. G. McCulloch. J. and P. Coats, Ltd.: E. L. B. Lart. English Sewing Cotton Co., Ltd.: Peter Ermen. English Velvet and Cord Dyers' Association, Ltd.: A. A. Crabtree; G. E. Holden. Leeds and District

Worsted Dyers' and Finishers' Association, Ltd.: C. W. Wade. Smith, Stone and Knight, Ltd.: T. Parker Smith. F. Steiner and Co., Ltd.: Harold Fothergill. United Turkey Red Co., Ltd.: J. F. Christie. Wallpaper Manufacturers, Ltd.: Osmund Smith. Yorkshire Indigo, Scarlet and Colour Dyers, Ltd.: George Hodgson.

Members elected by Trade Groups under Rule 37 (b). Calico Printing: T. T. Hurst; W. L. Dixon; E. Drew. Wool Dyeing: Henry Blackburn; George Garnett; H. Jennings; C. M. Whittaker. Cotton Dyeing: W. W. L. Lishman; G. H. Oldham. Silk Dyeing: Gilbert Tatton. Garment Dyeing: H. L. Mitchell. Paints and Pigments: Thomas Taylor. Miscellaneous: J. R. Denison.

Upon the motion of Mr. H. Blackburn, seconded by Mr. P. Caldwell, Mr. F. O. Ashmore was unanimously co-opted as a member of the Council.

Upon the motion of Mr. C. Rawson, seconded by Mr. E. L. B. Lart, Messrs. Bayley, Wood, Cave and Co., were unanimously elected auditors of the Association for the ensuing year.

Mr. T. PARKER SMITH proposed that a very hearty vote of thanks be accorded to the chairman for presiding, and in doing so said that his thoughts went back to the first meeting at Huddersfield which was really almost before the Association was formed. Subsequent meetings followed about 1915-1916, and although the chairman was not present at them, yet they all felt that the success of the working of the Association was largely due to his subsequent leadership during 14 years of strenuous endeavour. Those 14 years had been very eventful and full of very trying experiences, but, in the main, the results had been satisfactory. In Sir Henry Sutcliffe Smith they had had a chairman who had been eminently sympathetic towards the many points of view which had been put forward by the members.

The vote of thanks was carried unanimously by acclamation.

Regrets for inability to attend the meeting were received from Messrs. F. O. Ashmore, G. H. Oldham, G. E. Holden, J. R. Denison, W. W. Lishman and E. Carr Deakin.

Official Statistics from Government Departments.

THE inquirer who wishes to ascertain for himself precisely what official statistics are available on a particular subject, and where they are to be found, needs an alphabetical index to the contents of all official publications containing statistics. This need is met by the "Guide to Current Official Statistics," published annually by H.M. Stationery Office, price 1s. net. The current volume, which has just been issued, consists of a systematic index of nearly 300 pages to the statistical publications of 1933, giving details of the information which they provide on each subject. The source of the statistics is indicated by a simple system of key numbers referring the inquirer to a list of the titles and prices of the volumes indexed; and an indication of the wide scope of the data covered by the guide is afforded by the fact that this list occupies a further 50 pages.

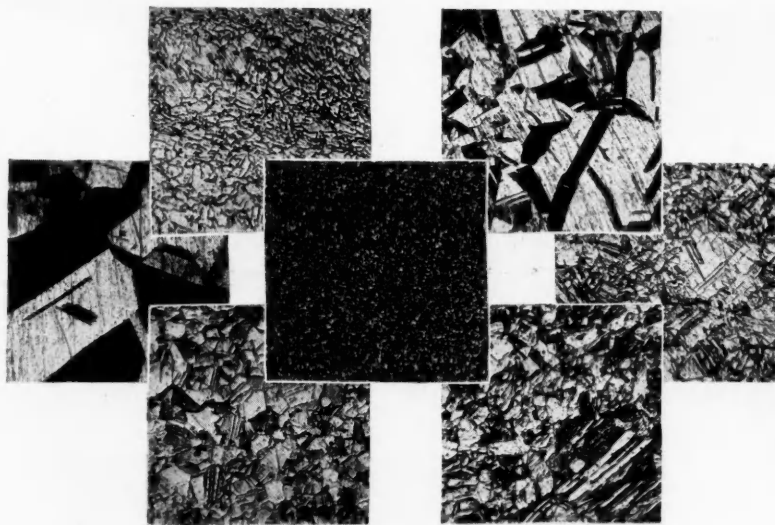


Fig. 1. Photomicrographs of the alloys used for seven standard condenser tubes. The alloy at the centre is Barronia metal. Magnification $\times 100$.

Condenser Tube Corrosion

CORROSION has been, for many years, one of the major problems of the metal industry. Its cause and mechanism are not always as simple as they appear to be, and no one alloy is capable of equally well resisting all corroding agents. Differences in the methods of working the metals, the exact routine which is followed in heat treatment, slight variations in composition, and the relative grain or crystal size as observed under the microscope, all show their influence in the ultimate corrosion resistance given by the finished metal surface. The life of any particular alloy under service conditions, moreover, cannot be estimated by laboratory tests, for corrosion tests which are made under one or more sets of conditions—simple immersion, alternate immersion, impingement, agitated or aerated—do not provide the accumulative effect of difference in temperature, concentration and turbulence of liquids, or amount of dissolved gases in the liquid. Therein lies many a story of the useless waste of thousands of pounds in condenser tubes alone.

The only safe answer to any question relating to corrosion lies in a knowledge of what the metal has done in service. Ten years ago technical opinion was divided on many points relating to the corrosion of condenser tubes, and in one school of thought the belief was held that the crystalline structure of tube metals was the source of much of the trouble. Barronia metal, a bronze alloy with a copper-tin base approximately 85/5 to which additions have been made to secure the desired mechanical properties, was produced with the object of providing an alloy with an ultra-fine structure, which would be unique in its resistance towards corrosion. This alloy has now been studied under a very wide range of service conditions, especially in connection with its use for condenser tubes, and Barronia Metals, Ltd., have accumulated a great deal of data upon its application in industry extending over a period of ten years, during which time Barronia tubes have been fitted in condensers working under the most diverse conditions.

The failure of condenser tubes has been attributed to a hundred-and-one causes, and an equal number of remedies have been tried, but the trouble still persists. The mere composition of an alloy is no criterion whatever of its actual behaviour under the complex conditions of modern condensers. Composition is, however, of great importance, as it determines the chemical nature of the protective scale which the tube takes on in the first weeks of its

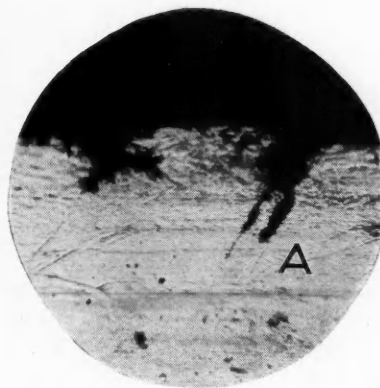


Fig. 2. Dezincification in a condenser tube alloy proceeds by intercrystalline paths.

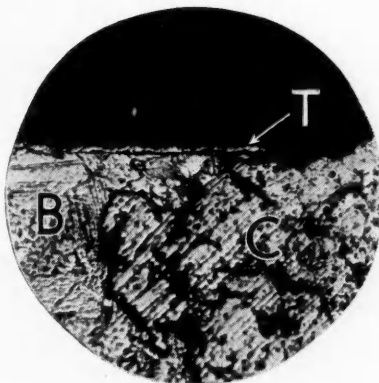


Fig. 3. Section of a tinned Admiralty mixture condenser tube showing three dissimilar metals in contact.

service. The life of a tube largely depends upon the nature of this protective scale. It is therefore vital that its chemical composition as determined by the analysis of the tube is such that the scale itself be chemically resistant to subsequent attack.

An accompanying group of photomicrographs (Fig. 1) shows seven alloys which are commonly used for condenser tubes. The photographs are strictly comparable, as they are all at the same magnification, *viz.*, 100 diameters. It will be seen that there is a big variation from alloy to alloy and that Barronia metal is the only one with a non-crystalline structure.

Crystalline Structure

The disability of a coarse crystalline structure in a tube is definitely established from a micrographic examination of tubes that fail. When a tube suffers dezincification, the process proceeds by inter-crystalline paths. This phenomenon can be clearly seen from the accompanying photomicrograph (Fig. 2). At the point marked A, corrosion can be observed to be proceeding down well-marked crystal boundaries. This feature is common to the failure of all tubes, whether they contain zinc or not. Crystalline struc-

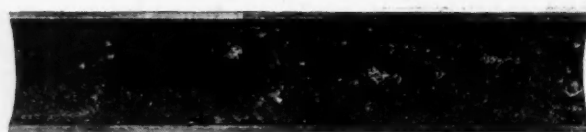


Fig. 4. A condenser tube which failed in Marine service after 7 months showing loose porous scale.



Fig. 6. Photomicrograph of the alloy used for "the tube which failed."



Fig. 5. The companion half of the "tube which failed," with scale removed.

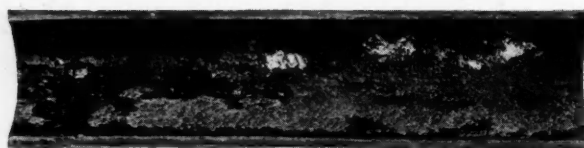


Fig. 7. Condenser tube made of crystalline metal which failed after 3 months' service with estuarine water.



Fig. 8. Condenser tube, made of Barronia metal, after 4 years' service with Mersey Dock water.

ture is therefore claimed to be a definite weakness, and the only effective safeguard is to have a tube which for all practical purposes is non-crystalline.

Once the process of corrosion sets in, it is accelerated by many other factors. Perhaps the most potent of these is the presence of dissimilar metals in contact, leading to electro-chemical action. Another photomicrograph (Fig. 3), is of a section of a tinned Admiralty mixture tube, and shows no less than three dissimilar metals in contact. The photograph shows the inner edge of the specimen. The tin coating has failed, thereby leading to dezincification of the deposited copper. This photomicrograph clearly establishes one of the disabilities of tinned tubes.

Erosion also plays an important part in the failure of tubes. The production of soft copper plugs by the process of dezincification described above, renders the decomposition products easily removable by erosion. Pits are thus formed, the tube wall is thinned locally, and further accelerating corrosion factors are thereby introduced, leading to complete failure of the tube at an early date.

Effect of Protective Scale

The life of a tube in service largely depends on the nature of the protective scale which it forms. No tube will last for ever; there is inevitably a slow but steady wastage in the thickness of the tube wall. The rate of this wastage is proportional to the wear of the protective scale, and this in turn depends upon its nature.

If the scale formed be of a loose or porous type it is rapidly worn away, with the result that further metal is used in forming further scale. This type of scale is illustrated (Figs. 4, 5 and 6) by a tube which failed within seven months. On the other hand, if the scale is of a vitreous non-porous character, and is closely adherent to the tube wall, the metal is protected from further wastage. The finer the individual

crystals of the metal the finer and more adhesive will be scale that is formed, as with Barronia metal where refinement of structure has been carried to the utmost limits. Such a scale, in addition to protecting the metal from corrosion, is in itself resistant to erosion. Figs. 7 and 8 show the difference between the scale formed by a crystalline tube and by a non-crystalline tube respectively.

Requirements of a Good Tube

From what has been said it is simple to deduce the one thing which ensures satisfactory life from a condenser tube—a scale which protects the metal underneath from any corrosion by the cooling water. To meet these conditions, the initial protective scale must have good mechanical qualities, *i.e.*, non-porous, closely adherent to the metal, and of a nature to resist erosion by water conditions (entangled air, etc.), and abrasion by solid matter in the cooling water, such as sand and grit. It must also have good chemical properties to enable it to resist corrosion.

Examination has been made of a large number of Barronia tubes that have seen service over periods up to ten years. In each case after the removal of any surface deposit, there has been found in close contact with the metal a very thin and extremely adhesive protective scale. As to the chemical resistance of the actual scale no more need be said than that no case of dezincification has been met. The reason for this is two-fold. In the first place the Barronia tube is practically devoid of crystalline structure. Secondly, the composition of Barronia metal is such that it results in a scale of requisite chemical resistance. The Barronia tube, moreover, is made from pure ingot metal, from which scrap and all other sources of impurities are rigidly excluded. It is made by a process which is scientifically controlled from beginning to end, and each tube is subjected to critical inspection and test before leaving the works.

Summer Meeting of the Institution of Petroleum Technologists

Reports on the Progress of Naphthology

THE summer meeting of the Institution of Petroleum Technologists was held in London on June 28 and 29, when two sessions were devoted to the discussion of "Reports on the Progress of Naphthology." On June 29 the reports in the refining and chemical section were dealt with, and Dr. F. H. Gardner (Chairman of the Abstracts Sub-Committee) presided.

The first annual report on the progress of naphthology was issued by the Institution in 1924. The chairman pointed out that over 100 different journals are abstracted in the course of the year, and, in addition, brief abstracts were given of the more important patent literature. The Abstracts Sub-Committee of the Institution was now considering the issue of a more complete detailed subject index of the abstracts than is issued at present, including an author index, as well as the production of a decennial index.

Lubricants and Lubrication

In the past year an increasing interest has been shown in the production of the best quality of lubricant possible from the raw materials available, said Dr. A. R. Bowen, Ph.D., F.I.C., A.M.I.Chem.E., in his report on "Lubricants and Lubrication." The recent symposium of the American Petroleum Institute has included descriptions of a number of new solvent refining processes which will doubtless be described more fully elsewhere in these reports, but of which mention must be made here. These solvent extraction processes separate a lubricating oil into high and low grade fractions, and among the solvents put forward are nitrobenzene, $\beta\beta$ -dichlorethyl ether and phenol; furfural has also been suggested. Phenol-treated oils have been marketed in this country to a small extent and have met with considerable success. The Duo-Sol process uses two immiscible solvents with which to treat a lubricating oil distillate, the solvents being liquid propane, which is the selective solvent for the paraffin-type constituents, and a special blend of coal-tar acids and bases being the solvent for the naphthenic-type constituents.

Hydrogenated lubricating oils have appeared on the British market during the past year, and on account of their good viscosity-temperature index and high degree of chemical stability have become unquestionably popular.

One factor of importance in the manufacture of lead soap lubricants is the necessity to incorporate the soaps with mineral oil at a temperature of approximately 400° F. in order to obtain maximum pressure stability. Many varieties of petroleum oil are used, but it is essential to employ a well-refined oil to avoid undue increase in viscosity and consistency of the lubricant owing to oxidation.

Value of Solvents

The value of certain solvents to split a petroleum fraction, such as a lubricating oil, into two separate series of hydrocarbons had been well brought out by investigators. Dr. Bowen particularly mentioned the work of one investigator in washing the lubricating oil fractions with alcohol and ether mixtures and obtaining two very different types of fractions; the oil washed out by the alcohol and the ether respectively had quite different properties, especially physically.

It was in the United States that a determined effort had been made to find the most suitable solvents for this type of refining treatment, which avoided loss and divided the oil into fractions both of which could be used. One investigator had examined the action of some 110 different organic chemical liquids in order to find the most selective solvent—nitrils, ketones, aldehydes, etc. Again, as the result of the investigations on the utilisation of two solvents, a notable process was that of Max Miller, known as the "Duo-Sol" process, in which the lubricating oil fraction was treated with cresol and liquid propane. The cresol washed out the less

desirable constituents, and the propane was the better solvent for the more paraffinic type constituents.

Mr. E. A. EVANS, whilst sympathising with the writer of a report faced with an enormous amount of literature—some of which was excellent, some probable and a lot less probable—objected to a suggestion that Paraflow had no effect on aircraft oils. He held that Paraflow had definite uses, and that it was nonsense to suggest that all aircraft oils were unaffected by it. As to a suggestion that instead of having specifications we should rely exclusively on engine tests, he said that it would be rather an expensive outlook for the petroleum industry if it had to buy turbines, aero engines, etc., and await the results of tests, it would not get very far. It was necessary to rely on a certain amount of experience; it might be a little hazardous, but it did carry us on to a certain degree. Discussing extreme pressure lubricants, he said he did not know of anybody making them in the manner described in the general literature. He believed there were only two extreme pressure lubricants made in this country, and he was responsible for one of them, but he did not use a saponifiable oil of mineral origin, as suggested in the report. A suggestion was also made that it was necessary to heat a lead soap with the oil to 400° F. in order to get maximum efficiency. The warmth of the heart, however, was sufficient to get the lead soap into the mineral oil.

Dr. BOWEN, replying, said he understood the action of Paraflow was less effective in the very heavy lubricating oils, according to the results of German workers of good repute. The note in the report concerning specifications of aero engine oil being not always sufficient came from the chief engineer of an important aero firm in America. Dr. Bowen added that he personally was not responsible for the statement concerning the use of a saponifiable mineral oil in extreme pressure lubricants. The effect of it was mentioned in the literature, and he gathered that the saponifiable mineral oil was treated with sulphuric or other acid.

Analysis and Testing

A comparison of the review on "Analysis and Testing," by C. Chilvers, B.Sc., F.I.C., with that for 1932 shows a striking increase, partly due to the World Petroleum Congress, in the number of references. As has previously been the case, there appears to be a tendency to concentrate on two or three groups of products, while progress under such headings as crude oil, white spirit, kerosine, gas oil and fuel oil, is still very scanty. On the other hand, much work has been done on motor fuels, lubricants (including viscometry) and particularly on bituminous materials.

Standardisation efforts still proceed. At the World Petroleum Congress, international co-operation in standardisation in relation to petroleum products was discussed by Anderson, Dunstan and Weiss. It was resolved that all proposals concerning international standardisation should be submitted through Committee 28 of the I.S.A. A number of sub-committees of this Institution have methods of test under examination in preparation for the next edition of Standard Methods of Testing. The triennial volume of A.S.T.M. Standards has been published, together with the annual report of Committee D-2 of that Society, on Petroleum Products and Lubricants. Some tentative methods have been advanced to standards, but the only important change is in the procedure for cloud and pour points.

Efforts are still being made to improve existing apparatus and technique and to devise satisfactory new methods for determining sulphur in petroleum products. With regard to light fractions, lamp methods still retain their supremacy, and with heavier products, although alternatives to the bomb method have been put forward, the latter is still most generally used. Various modifications of lamps designed to increase the rate of burning have been introduced. Considerable importance is attached to the determination of corrosive

and reactive sulphur, and an I.P.T. Sub-Committee is examining this question.

The significance of distillation tests for lubricating oils has been considered by several investigators. Vacuum distillation with a pressure as low as 0.2 mm. mercury has been favoured and it is suggested that an oil is better characterised by the slope of the curve between two arbitrary points than by the usual tests. A claim that gumming and non-gumming oils may be distinguished by the ultra-violet radiation test has been made. Specific gravity, viscosity at 50° C., setting point, asphalt, coke and colour are claimed to be sufficient tests for motor lubricants, but the modern tendency with lubricating oils, as with other petroleum products, is to include a laboratory test, which, in a short time, will give an indication of the condition of the oil after normal usage. Many oxidation tests have been suggested in various countries and several papers at the World Petroleum Congress gave rise to considerable discussion on this question. Interpretation of the results in terms of engine practice is difficult, and, since different methods (or even slight variations of procedure in the same method) give quite different results, some international standard method could be adopted with advantage.

Viscosity-Temperature Characteristics

Viscosity-temperature characteristics are still the subject of much discussion. Not only in the United States, but elsewhere, the value of the Dean and Davis viscosity index system has been very widely recognised. Several further modifications and alternatives have, however, been suggested, largely because the system is based on Saybolt viscosities and not upon fundamental units. Viscosity and its expression caused much discussion at the World Petroleum Congress and although it was generally agreed that viscosities should be expressed in C.G.S. units, the relative merits of the stoke and poise were the subject of some controversy. A majority favoured the adoption of kinematic units, and a resolution that this is desirable was passed, with the addition that specific gravities should also be reported.

Dr. C. Chilvers expressed the view that the value of the reports was chiefly as an indication of sources of information which might have been overlooked during general reading, for it was almost impossible for an individual to cover the whole field of literature comprehensively. Thus the reports must cover, not only the more important papers appearing in the more widely read journals, but also notices of papers from more obscure sources. In this way an investigator, provided he could rely on the comprehensive nature of the report, could obtain a complete picture of work on any particular phase of the industry during the period under review.

With regard to analysis and testing, the importance of interpretation of results could not be over-emphasised; in fact, there were published too many methods which could never be of any but academic interest. There was a definite tendency, however, to attempt to correlate specific tests on a product with its behaviour in practice. For example, the distillation test for gasolines had been interpreted in terms of starting characteristics, vapour-locking tendency and dilution of the lubricating oil. In the case of the oxidation test on lubricating oils, however, which was intended to indicate the carbon forming tendency of the oil in practice, much further work was necessary before any definite correlation could be claimed.

Standard Test Methods

There was an increasing tendency to apply some mechanical test to lubricating oils, for measuring "oiliness," but it was very doubtful if many or even any two of the machines described gave comparable results. For bituminous materials also efforts were being made to devise methods of test which would give some information on the behaviour of the material when applied to the road. Particularly did this apply to emulsions, for which a number of breakdown tests, had been suggested, but none seemed to take into consideration all the various factors on the road. The question of viscosity and viscosity/temperature relationships had again attracted much attention, but since the original Dean and Davis publication there had been rather a multiplicity of modified systems.

Discussing the need for standard methods of testing petro-

leum products, Mr. Chilvers said that a great deal of work had been and was being done by various sub-committees in connection with the preparation of the next edition of "Standard Methods of Test." The problem of international standardisation seemed to be as urgent as ever. It was discussed at the World Petroleum Congress, but it was not clear what action was being taken. In America there was the A.S.T.M., in England the B.S.I. and I.P.T., in France the A.F.N.O.R., in Germany the D.V.M., and there was also an official Italian standardisation committee. A survey of publications of these societies showed a very striking lack of uniformity in some of the methods of test used in the various countries. Quite recently the A.S.T.M. and I.P.T. had tentatively standardised different procedures for preformed gum determination, while the A.F.N.O.R. had circulated quite different proposals. For determining flash points and colour there were various apparatus existing. There was urgent need for closer co-operation and more official interchanging of proposals between the various organisations.

Dr. A. E. DUNSTAN (chief chemist, Anglo-persian Oil Co.) referred to the plea made by Mr. Chilvers for international co-operation in respect of standards and said it was increasing. For instance, the Institution maintained the very happiest relations with the American Society for Testing Materials, and he had been re-elected hon. chairman of the committee of that body dealing with petroleum.

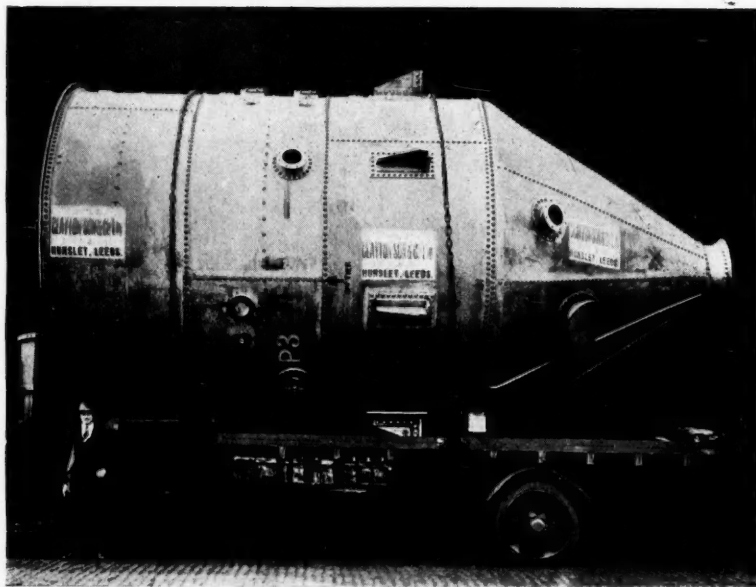
Although it seems likely that the classical method of purifying petroleum products, by treatment with sulphuric acid, will continue to play a considerable part in petroleum technology for a long time to come, an ever-growing tendency to avoid its manifest disadvantages by employing other processes has been reported during the last few years. During the period now reviewed by C. G. Verver and R. N. J. Saal, in their report on "Chemical and Physical Refining," this trend has continued. It is probable, however, that the actual "flight from sulphuric acid refining" is not so rapid in practice as would appear from a study of the articles published, since these obviously deal with products presenting the greatest difficulties (e.g., cracked spirit), whilst little change has, generally speaking, taken place in the well-established methods of treating such relatively "easy" materials as kerosines and white spirits.

Reduction of High Sulphur Content

For the reduction of a high sulphur content, sulphuric acid is as yet in many cases the only suitable refining agent. During an investigation on Playa del Rey (California) crude oil, containing 2.2 per cent. of sulphur, the greatest diminution of sulphur in the straight-run gasoline, viz., 0.43 per cent. to 0.08 per cent. was obtained by a treatment with soda, 10 lb. of acid per barrel in three washes, followed by neutralisation and redistillation, whilst other refining agents (strong NaOH, $AlCl_3$, lime, cuprous oxide, Na_2CO_3 , or oxidising agents) either failed to give the same reduction or resulted in a high ash content.

The sulphonic acids formed on treating a petroleum product (principally a lubricating oil) with acid now find a steadily increasing use as emulsifiers, Twitchell reagents, etc. The disposal of acid tars is a perennial problem. A new method for the regeneration of sulphuric acid from refinery acid sludge, known as the Hechenbleikner process consists in decomposing the sludge in a rotary kiln by allowing it to flow in counter-current against hot combustion gases. The resulting gas, which may contain up to 20 per cent. of SO_2 , is freed from volatile oil, and the greater part of the water vapour by passage through washers. After a final drying with 85-93 per cent. of sulphuric acid, the gas is diluted with air and contacted over a vanadium catalyst in the normal manner. It is claimed that 90 per cent. of the acid in the sludge is regenerated, the plant costs amounting to about \$4 per ton of 100 per cent. acid. A coke of high heat value is obtained as a by-product from the kiln.

The "sweetening" of a gasoline involves the conversion of the mercaptans into dialkyl-disulphides, and the processes employed to effect this change may be subdivided into (a) reactions involving the addition of an atom of sulphur, and (b) oxidation reactions. The former group is, of course, represented by the well-known doctor treatment, and this reaction has this year again brought forth a crop of patents, usually covering minor variations in the standard procedure.



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The Chemical Age Lawn Tennis Tournament

Cup Holders Reach the Final

SEVERAL further matches in the fourth annual CHEMICAL AGE Lawn Tennis Tournament were played during the past few days and there are prospects of exciting finals in both the doubles and singles. F. G. Hawley and J. Haines (Anglo-Persian Oil Co., Ltd.), who won THE CHEMICAL AGE silver challenge cup last year, have won their way into the final again this year, having defeated A. S. Marcar and G. H. Trigg (Bovril, Ltd.) in the semi-final by 6-3, 6-1. The remaining semi-final in the doubles will be between S. E. Chaloner and C. Thedford (Monsanto Chemical Works, Ltd., Ruabon) and V. J. Prosser and A. Baxter (John Haig and Co., Ltd.). Until the early part of this season Chaloner was partnered by W. Speakman, who had to drop out owing to a business trip overseas. Chaloner and his partner were the winners of the cup in 1932.

All the third round matches in the singles have been completed, and two of the fourth round encounters have been decided. R. N. B. D. Bruce (Gas Light and Coke Co.) and A. Baxter (United Yeast Co., Ltd.) have already reached the semi-final, and the other semi-finalists will be the winners respectively of the Grape v. Giltrow and Tunstall v. Chaloner matches of which particulars are given below.

The draw for the doubles semi-finals has already been announced. The draw for the singles semi-finals has been made this week in order to facilitate the playing off of the matches without any unnecessary delay. Details of remaining matches are as follows:

DOUBLES—FINAL.

| | |
|--|--|
| Hawley, F. G., & Haines, J. Anglo-Persian Oil Co., Ltd., Britan- nic House, Finsbury Circus, London, E.C.2. (National 1212.) | Chaloner, S. E. & C. Thedford. Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.) |
| | or |
| | Prosser, V. J., & Baxter, A. John Haig & Co., Ltd., Kinnaird House, 2, Pall Mall East, London. (Whitehall 1040.) |

SINGLES—SEMI-FINALS.

| | |
|---|--|
| Bruce, R. N. B. D. Gas Light & Coke Co., No. 1 Labora- tory, Kings Road, Fulham, S.W.6. (Fulham 5531.) | Baxter, Albert. United Yeast Co., Ltd., 238, City Road, London, E.C.1. (Clerkenwell 0303.) |
| Grape, L. F. Borax Consolidated, Ltd., Regis House, King William Street, Lon- don. (Mansion House, 8332.) | Tunstall, P. A. Salt Union, Ltd., 20, Water Street, Liverpool. (Central 4370.) |
| or | or |
| Giltrow, L. Williams (Hounslow), Ltd., Houns- low. (Hounslow 2929.) | Chaloner, S. E. Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.) |

Results of matches played during July were as follows:

DOUBLES—THIRD ROUND.

F. G. Hawley and J. Haines (Anglo-Persian Oil Co., Ltd.) beat A. E. C. Wilshire and L. F. Grape (Borax Consolidated, Ltd.), 6-1, 6-1.

V. J. Prosser and A. Baxter (John Haig and Co., Ltd.) beat E. H. M. Badger and R. N. B. D. Bruce (Gas Light and Coke Co.), 6-3, 6-4.

A. S. Marcar and G. H. Trigg (Bovril, Ltd.) beat E. Thomsett and R. Welsh (British Oxygen Co., Ltd.), 6-2, 6-3.

S. E. Chaloner and C. Thedford (Monsanto Chemical Works, Ltd., Ruabon) beat C. G. Copp and R. D. Hayman (Doulton and Co., Ltd.), 6-4, 6-3.

DOUBLES—SEMI-FINAL.

F. G. Hawley and J. Haines (Anglo-Persian Oil Co., Ltd.) beat A. S. Marcar and G. H. Trigg (Bovril, Ltd.), 6-3, 6-1.

The remaining semi-final will be between S. E. Chaloner and C. Thedford (Monsanto Chemical Works, Ltd.) and V. J. Prosser and A. Baxter (John Haig and Co., Ltd.).

SINGLES—THIRD ROUND.

A Collins (British Oxygen Co., Ltd.) beat H. R. Whitaker (Williams, Hounslow, Ltd.), 6-0, 10-8.

R. N. B. D. Bruce (Gas Light and Coke Co.), walk-over, H. A. Hare (Grindley and Co., Ltd.), scratched.

A. S. Marcar (Bovril, Ltd.) beat W. L. Alldis (Brandhurst Co., Ltd.), 6-2, 6-3.

A. Baxter (United Yeast Co., Ltd.) beat G. F. Hammond (Williams, Hounslow, Ltd.), 6-1, 6-3.

L. F. Grape (Borax Consolidated, Ltd.) beat R. Welsh (British Oxygen Co., Ltd.), 6-3, 7-5.

L. Giltrow (Williams, Hounslow, Ltd.) beat C. G. Copp (Doulton and Co., Ltd.), 6-3, 7-5.

S. E. Chaloner (Monsanto Chemical Works, Ltd., Ruabon) walk-over, R. F. Porter (Howards and Sons, Ltd.), scratched.

P. A. Tunstall (Salt Union, Ltd.) beat I. Williams (Monsanto Chemical Works, Ltd., Ruabon), 7-5, 6-3.

SINGLES—FOURTH ROUND.

R. N. B. D. Bruce (Gas Light and Coke Co.) beat A. Collins (British Oxygen Co., Ltd.), 8-6, 6-1.

A. Baxter (United Yeast Co., Ltd.) beat A. S. Marcar (Bovril, Ltd.), 6-4, 6-4.

There are still two matches to be played in the fourth round, namely (1) L. F. Grape (Borax Consolidated, Ltd.) versus L. Giltrow (Williams, Hounslow, Ltd.), and (2) P. A. Tunstall (Salt Union, Ltd.) versus S. E. Chaloner (Monsanto Chemical Works, Ltd.).

All the remaining games, other than the finals, should be played off as early as possible, and the results forwarded to the Editor of THE CHEMICAL AGE immediately after each match.

The finals have been fixed for Saturday, September 15. As previously announced in THE CHEMICAL AGE, we have accepted a cordial invitation from the Anglo-Persian Oil Co., Ltd., to arrange for them to be played at the Britannic House Club, Lower Sydenham; further details will be issued later, and invitations will be sent out within the next fortnight. Thomas Hill-Jones, Ltd., of Invicta Works, Bow Common Lane, E.3, have kindly promised to present "Invicta" silver statuettes to be awarded outright to the winner of the doubles and the singles, and Mr. W. Lloyd-Willey, director of the same company, is presenting silver statuettes of similar pattern, to be known as the "Lloyd-Willey" statuettes, for each of the three runners-up. The winners of the doubles and singles respectively will hold, jointly with the firms they represent, THE CHEMICAL AGE silver challenge cups for twelve months.

Beit Research Fellowship

Awards for Academic Year 1934-35

THE following Beit Fellowships for Scientific Research at the Imperial College of Science and Technology, during the Academic Year 1934-35, have been awarded: New Fellowships for one year, renewable for a second year, to Mr. H. I. Stonehill, of East London College, for research into the applicability of the modern theories of strong electrolytes due to Debye, La Mer, Bjerrum, Davies, etc., the experimental work taking the form of measurement of the e.m.f. of certain cells, under Professor J. C. Philip; Mr. J. R. Tillman, of the Imperial College, for research on electron diffraction, both from the point of view of studying crystal forms and the mechanism of diffraction, under Professor G. P. Thomson; Mr. J. Bell, of the Imperial College, 1927-34, for a spectrographic investigation of hydrocarbon combustion, under Professor W. A. Bone. Extensions of fellowships already satisfactorily held for one year have been awarded to Dr. K. Bailey, for research on seed mucocellulose and its relation to the chemistry and hydration of the plant cell wall; Mr. M. Blackman, for research in mathematics on the several different properties of crystal lattices with particular reference to the specific heat; and Mr. S. F. Boys, for research in chemistry and particularly a review of the theoretical work on optical rotatory power.

British Standards Institution

Annual Report for 1934

THE annual meeting of the British Standards Institution was held on July 13, when Dr. E. F. Armstrong, F.R.S., was unanimously elected to succeed Mr. E. J. Elford as chairman of the General Council. Dr. Armstrong bears a name which is a household word in the chemical industry and needs no introduction to readers of THE CHEMICAL AGE. Moreover the whole hearted co-operation of the chemical industries, which the British Standards Institution now so thoroughly enjoys, is due in large measure to Dr. Armstrong's ability and foresight in piloting the negotiations, when this work was initiated. The progress which the chemical work is making, and it must be remembered that it only came into operation in 1931, is in large measure due to the wisdom and tact with which, as chairman, he has guided the work of the Chemical Divisional Council.

Colour Standards

As outlined in the report for 1933, the Institution has been endeavouring to give effect to the resolution passed at the Ottawa Conference with a view of providing an accurate means of colour information and the securing of a basic standard in the use of colours for all purposes. The British Colour Council, formed in 1931, with the object of placing the determination of colour for the British Empire in British hands, had already gone a long way towards the evolution of a standard colour schedule adaptable to the needs of all industries. The Institution has been in close touch with this work with a view of securing that the colour schedule of the British Colour Council, when completed, may be accepted as a British standard and ultimately receive Empire endorsement. The British Colour Council schedule, now issued, is recognised as B.S.S. No. 543, of 1934.

Recently an important step has been taken in the chemical division by the setting up of machinery for the development of dairy standards. This has come about through the transference to the Institution of work begun by certain committees acting under the Empire Marketing Board.

Work of the Chemical Division

The work of the chemical division in regard to the standardisation of tar acids and phenol has been brought to a completion in the past year by the issue of the specifications covering phenol and the whole range of the more generally used cresylic and carbolic acids. Certain of the specifications will be of interest to pharmacists, and to the manufacturers of pharmaceutical chemicals derived from phenol or cresol. Makers of synthetic resins, disinfectants, explosives, soap, synthetic perfumery, leather, photographic chemicals, dyestuffs, paint, and the brewing industry will find use for most of these specifications. The use of these British standard specifications will ensure the supply of uniform quality from one consignment to another, and of tar acid fractions which are already commercially available.

Work on scientific glassware, which was taken over from the joint committee formerly under the aegis of the Institute of Chemistry, has six sub-committees dealing with the preparation of British standard specifications for volumetric glassware, thermometers, hydrometers, distillation apparatus, laboratory porcelain, and qualities of glassware. So far as volumetric glassware is concerned specifications have been completed for interchangeable conical ground glass joints, distillation flasks and graduated measuring cylinders, and the committee have in the course of preparation specifications for Crow receivers, Nessler cylinders, centrifuge tubes, Petri dishes, test tubes and other tubes and flasks. A panel is also dealing with the setting up of a standard Dean and Stark apparatus.

The Chemical Divisional Council has decided after a careful review of metric units of volume to adopt the recommendation of the joint Committee for the Standardisation of Scientific Glassware, and decided that in all British standard specifications prepared for use in the chemical industry in which reference is made to metric units of volume, the unit

to be employed shall be the millilitre (abbreviation ml.) in preference to cubic centimetres. A report on the subject has been issued as B.S.S. No. 501. It has also been decided to adopt 20° C. (international temperature scale) as the standard temperature for British standard volumetric glassware instead of the former 15° C. The decision to adopt this temperature was reached after careful consideration of current practice throughout the British Empire and foreign countries. A brief account of the considerations which led to the decision are given in the report issued as B.S.S. No. 554.

Testing of Disinfectants

A standard technique for determining the Rideal-Walker coefficient of disinfectants has been issued and must be regarded as an event of first importance to manufacturers of disinfectants. The Rideal-Walker method of comparing disinfectants was first published in 1903 in this country, in certain of the Dominions and in America. Since then modifications have been introduced into the procedure not only by the originators of the test but by other workers, which has led to a great deal of confusion and to numerous disputes between buyers and sellers of disinfectants. The difficulties have been enhanced by the fact that disinfectants pass from considerable distances between the maker and the buyer. With a view to eliminating this anomalous position, the procedure set out in B.S.S. No. 541 has been drawn up after a careful and exhaustive series of investigations in regard to the points which were likely to affect the results of the test. The committee have satisfied themselves that the standardised technique, if carefully followed, will give concordant results in the hands of competent workers. It is, therefore, recommended for general adoption by all who purchase and supply disinfectants on the basis of the Rideal-Walker coefficient. A sub-committee is now at work examining the alternative Chick-Martin test with a view to its issue also as a British standard.

At the request of the Imperial Agricultural Bureaux, a technical committee has been appointed to take over and continue the work of the Dairy Research Committee of the Empire Marketing Board, and to deal with any further standardisation work which may be shown to be desirable in the interest of the dairy industry. Four sub-committees are dealing with volumetric glassware, freezing point of milk, chemical analysis and bacteriological technique.

Specifications for methods of sampling vegetable oils and fats both in packages and in bulk are in course of preparation.

The question of preparing standard methods for sampling coal tar products has been under consideration and a draft specification has been prepared based on the existing proposals drafted by the Standardisation of Tar Products Tests Committee. These have now been circulated for general comment and criticism.

Sampling of Coal and Coke

Two important specifications have been issued in connection with the work of the preparation of British standard methods for the sampling and analysis of coal and coke. The specification for the sampling and analysis of coke was prepared after extensive trials had been carried out on both oven and gas cokes. The basis of the specification is the same as that used for small coal except that the moisture content of coke was chosen as the most variable factor. The specification for the sampling of large coal represents the agreed recommendations of the committee in regard to what is perhaps the most difficult problem the coal trade has to face. The question has received a great deal of attention both in this country and abroad and hitherto the methods used have been somewhat empirical and as a consequence a higher factor of safety has been employed, resulting in very large gross samples. The British standard method follows in general principles the same theory that was adopted as a basis for the sampling of small coal, and recommends minimum sizes of samples based on the theory of errors, in which

the size of the sample is directly related to the heterogeneity of the fuel and the degree of accuracy required. As a consequence, it has been found possible in the specification to recommend the adoption of considerably smaller sizes of gross samples than those previously employed. The committee are unable to recommend a standard method for sampling from heaps which would be generally applicable, having due regard to the possible heterogeneous nature of the heap. A full account of the experiments and theoretical considerations which form a basis for the specification have been included as an appendix.

Methods have also been completed for the determination of phosphorus in coal and coke and for the agglutinating value of coal, and these will be published shortly. Methods are in the course of preparation for the ultimate analysis of coal and of coal and coke ash, and a committee is at present dealing with the preparation of British standard methods for the sampling and analysis of fuel for boiler trials.

Gross and Net Calorific Value

Arising out of the resolution made at the London Fuel Conference in 1928, consideration is now being given by the International Standards Association to the setting up of international standards dealing with the definition of gross and net calorific values of solid, liquid and gaseous fuels. The British Standards Institution accepted the invitation of the World Power Conference to undertake to present the British viewpoint as to what was the practice in Great Britain in regard to the definitions of the terms "gross" and "net" calorific value and the way in which they were used. The recommendations on this subject have been issued as B.S.S. No. 526.

There are now nineteen technical committees, and forty-nine sub-committees and panels in the chemical division of the British Standards Institution. During the period under review, the following specifications were issued:—

No. 496, Sampling and Analysis of Coke. No. 501, Metric Units of Volume. No. 502, Sampling of Large and Run-of-Mine Coal. No. 503, Creosote for Fuel in Furnaces. No. 506, Methyl Alcohol (Methanol). No. 507, Ethyl Alcohol. No. 508, Normal Butyl Alcohol (Butanol). No. 509, Acetone. No. 515, Crude Carbolic Acids, 60's and 45's. No. 516, Distilled Carbolic Acids, 60's and 45's. No. 517, Cresylic Acid of High Orthocresol Content. No. 521, Cresylic Acid (50/55 per cent. Metacresol). No. 522, Orthocresol, Metacresol and Paracresol. No. 523, Phenol. No. 524, Refined Cresylic Acid, Grades "A" and "B." No. 526, Definitions of Gross and Net Calorific Value. No. 541, Determination of the Rideal-Walker Coefficient of Disinfectants. No. 549, Diacetone Alcohol. No. 551, Normal Butyl Acetate. No. 552, Amyl Acetate. No. 553, Ethyl Acetate. No. 554, Standard Temperature of Volumetric Glassware. No. 334, Chemical Lead.

The following new specifications are in course of preparation:—

Agglutinating value of coal, methods of analysis of coal and coke ash, carbide of calcium, carbon disulphide, carbon tetrachloride, castor oil, centrifuge tubes, Chick-Martin test for disinfectants, chromic acid for electro-plating, coconut oil, conical ground glass joints, cotton seed oil, crow receivers, Dean and Stark apparatus, dibutyl phthalate, diethyl phthalate, distillation flasks, ethyl lactate, flasks with graduated necks, general purposes laboratory thermometers, glacial acetic acid, 99-100 per cent., glues, graduated measuring cylinders, ground nut oil, hexachlorethane, hydrometers, maximum and minimum meteorological thermometers, Nessler cylinders, nickel ammonium sulphate for electro-plating, nickel sulphate for electro-plating, olive oil, perilla oil, petri dishes, determination of phosphorus in coal and coke, potassium cyanides for electro-plating, rape seed oil, raw linseed oil, sampling and analysis of fuel for boiler and power station trials, sampling of tar products, sampling of vegetable oils and fats in packages or in bulk, soya bean oil, standard distillation apparatus, swelling test for coal, technical acetic acid, 98-100 per cent., technical acetic acid, 80, 60, and 40 per cent., technical ether, test tubes, trichlorethylene, tung oil, methods for the determination of the ultimate analysis of coal, vegetable tanned sole leather, and methods for the determination of viscosity of heavy liquids.

Chemical Engineering

The dimensional standardisation which is being undertaken in regard to chemical stoneware is at present confined to pipes. It has been decided to prepare standard methods for mechanical and physical tests and a limited range of chemical tests. The committee are of the opinion that it would be difficult at the present time to attempt to set up standard

limits for the various grades of stoneware that are being used in this country, though they feel that, after a certain amount of practical experience has been gained in the application of the methods of test they may be practicable.

Arising out of a request received from the Home Office a committee is investigating the question of the preparation of a standard specification for hydro-extractors as a guide to makers and users, and a small exploratory sub-committee is at present considering the accidents which have arisen through failures of hydro-extractors, with a view to reporting to the technical committee the possibilities of standardisation and the direction which it should take.

There are now eleven technical committees and twelve sub-committees under the Chemical Engineering Industry Committee. A revised specification is in hand for chemical fire extinguishers. The following new specifications are in course of preparation:—Glass carboys, stoneware containers, Winchester quarts, metal containers, welded containers for noxious gases, chemical stoneware, and hydro-extractors.

Taxation and Research

An Injustice to Industry

IN an address recently delivered to the Association of Scientific Workers by its chairman, Mr. R. W. Western, attention was directed to the procedure in assessing income tax on commercial undertakings, whereby the position of scientific research as an aid in industry is seriously prejudiced. According to the present ruling of Inland Revenue officials, any expenditure on the scientific research incurred in connection with a commercial or industrial undertaking is not counted as an expense which may be deducted from gross profits before assessment, but must be treated as capital expenditure and deducted from the amount available for distribution as dividend. Further, no allowance is made for depreciation of plant used in research, unless it is to be replaced—an obviously inappropriate condition. While it may be perfectly logical and in accordance with the strict principles of accounting to charge expenses of scientific research to capital, it offers a too-obvious inducement to business concerns, when they have to meet their shareholders in these strenuous times to economise by cutting out research. In any event, it discourages co-operation between science and industry. Mr. Western's suggested "innovation fund," free from tax, as a remedy for the situation has one feature which would be an undoubted advantage. This is the proposal that firms should publish particulars of their expenditure for purposes of scientific research, either singly or in groups. If to this could be added, without breach of confidence or revelation of trade secrets, some indication of the aims and achievement of such research, it would increase many-fold the interest of the general public in science.

New Radioactive Element

Atomic Weight 240

THE Czechoslovak newspapers state that an element of higher atomic weight than uranium has been discovered in Joachimsthal pitchblende. The element discovered by Dr. O. Koblic has been assigned the atomic number 93 and its atomic weight has been found to be 240 from an analysis of the silver salt, $\text{Ag}(\text{93})\text{O}_4$. The new element forms an acid analogous to HReO_4 , and also salts similar to the permanganates and perhenates. Acting upon the supposition that the sodium salt of $\text{H}(\text{93})\text{O}_4$ would be very soluble, Dr. Koblic concentrated the mother liquor from the alkali treatment of pitchblende in the extraction of uranium and radium compounds, and the acidified filtrate was precipitated first with silver nitrate and finally with thallium nitrate. This gave the expected $\text{Tl}(\text{93})\text{O}_4$ as a red crystalline precipitate. It was re-converted into the more soluble yellow silver salt, 115 mg. of which were obtained. The discoverer has suggested the name "Bohemium" for the new element, which is probably the disintegration product of the actinium series. It is estimated that crude pitchblende contains about one per cent of the new element.

Manufacture of Lithopone

Terms of Compulsory Licence

IN the Chancery Division, on July 26, Mr. Justice Luxmoore had before him the question of the terms of the compulsory licence to manufacture lithopone to be granted McKechnie Bros., Ltd., of Widnes, by the I. G. Farbenindustrie, the registered owners of the patent granted in 1923, for "improvements in the manufacture of lithopone," his lordship having upheld the decision of the Comptroller of Patents that such a licence should be granted.

The Comptroller proposed to grant to McKechnies a licence similar to that the I.G. had granted to Orr's Zinc White, Ltd., on the basis of a 2 per cent. royalty of the selling price, with a minimum of £1,000 a year.

Mr. Whitehead, K.C., for I.G. argued that 2 per cent. was too small a royalty, and that it should be increased to 5 per cent.

McKechnie Bros. produced their own material and therefore were in a more advantageous position than Orr's Zinc White Co. They were unable to produce at a lower price.

Sir Arthur Colefax, K.C., for McKechnie Bros., said on the question of raw material the cost of recovery had to be taken into consideration, and its market value. There was no warranty for the suggestion that McKechnies were in a more advantageous position than Orr's Zinc White, and he submitted that 2 per cent. was a fair royalty on the licence to be issued.

His lordship said counsel could agree that the licence should be re-drafted so as to provide for the unrestricted licence with the proviso that McKechnies should, in the first instance, use only their own raw material in the manufacture of lithopone under the patent and that they should not be entitled to use the patent for any purchased material unless it was necessary for them to do so owing to shortage of their own material for the requirements of their trade. He granted the licence as proposed by the Comptroller and he dismissed the appeal with costs.

Goods Transport by Road

Deputation to the Minister of Transport

A DEPUTATION from the British Road Federation, representative of the Association of British Chemical Manufacturers and 31 other national organisations interested in road transport, was received by the Minister of Transport, Mr. L. Hore-Belisha, M.P., on July 20 in support of proposals on the question of (a) classification of vehicles in the first schedule to the Road Traffic Bill, 1934; (b) axle weights; (c) laden weights in the case of insulated vehicles; and (d) consolidation of the regulations.

Mr. S. N. Horne, chairman of the Operators' Committee of the British Road Federation, in the absence abroad of Earl Howe, chairman of the Federation, in introducing the deputation, referred to the fact that it was the first representative deputation from the road transport industry to be received by the new Minister of Transport, and assured him of the co-operation of the Federation upon all matters concerning road transport.

The Minister was urged to provide for an increase in the permitted laden weights in the case of insulated transport. It was pointed out that the conveyance of perishable goods was a specialised part of the road motor transport industry. The efforts of those engaged in this branch of the industry had been directed towards ensuring that the load was carried in the most hygienic and efficient manner possible. This had resulted in insulated bodies, weighing from 30 cwt. to 2 tons, being fitted. These insulators were built of a suitable size to carry a normal pay load and if partly loaded, the insulation efficiency was considerably reduced. If fully loaded, the gross load of the vehicle usually exceeded the legal maximum by approximately the weight of the insulator. In view of the perishable and urgent nature of these special loads, a high standard of mechanical and braking efficiency had to be maintained for motor vehicles used for its transport, and this, together with the invariable use of pneumatic

tyres, reduced to the minimum any injurious effects which these vehicles were likely to have upon road surfaces when laden to full capacity. It was submitted that it was reasonable and equitable that the regulations should be so amended as to permit, in the case of these special vehicles when fitted with pneumatic tyres an increase in the permitted laden weight over and above that applicable to vehicles not carrying an insulated body.

In reply the Minister stated that he would carefully consider the views expressed.

Our Improved Position

Annual Report of Benn Brothers, Ltd.

THE directors of Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE, in their annual report state that the accounts for the year ended June 30 disclose a slightly better position than those of a year ago. Usual allocations to reserves have been made, and the amount set apart for the Jubilee Pension Fund has been increased by £500. The directors recommend the payment of dividends at the same rate as before—6 per cent. on the preference shares and 15 per cent. on the ordinary shares. The report states that "The Gas World" completed fifty years of service and signalled the event with the largest issue in its history. "The Hardware Trade Journal" published an equally noteworthy issue to mark its diamond jubilee, the size of the issue being limited only by the Post Office restrictions. The company has also been responsible as publishers on behalf of Independent Weekly Publications, Ltd., for the issue of Sir Ernest Benn's vigorous new weekly, "The Independent," since the first week of last October.

"The year has witnessed further encroachments upon the trade paper field by government departments and official publications," continues the report, "that of the Milk Marketing Board being among the most recent of these illegitimate periodicals. The board expresses to Mr. Percival Marshall its appreciation of the stand he made at the Leicester Advertising Convention against the growth of this pernicious movement. Government departments, while increasing their control over trade after trade, are not, in our view, justified in using their influential position to derive advertisement revenues for official propagandist sheets, most of which have no excuse for existence considered from the orthodox publishing point of view."

On accepting appointment as chairman and managing director of the United Kingdom Provident Institution, in succession to the late Lord Revelstoke, Sir Ernest Benn resigned the chairmanship of Trade Promotion Trust, Ltd., and Mr. A. R. Pain was elected to that position. The business of the company has been well maintained and its continued success has been evenly shared by most of its publications. The position of the company as the acknowledged publishers of the leading trade and technical journals in the world remains as clear and unchallenged as ever. The experiment of a provincial office, started in Glasgow, has proved sufficiently successful to warrant the establishment of a second branch office in Birmingham which will be opened in the next few weeks.

A New Range of Tested Analytical Reagents

MODERN analytical methods demand that only the purest and most reliable reagents shall be used. It is also of vital importance that the analyst should definitely know the maximum amounts of impurities which the reagent is liable to contain. To meet these requirements J. W. Towers and Co., Ltd., are shortly placing on the market a range of over 200 analytical reagents of specified and guaranteed purity. To avoid all risks of contamination by dust, moisture, cork fragments, etc., each batch, after being most carefully tested, is packed at the works into specially made amber glass bottles fitted with bakelite screw caps, which have been adopted as standard package for Towers Tested Analytical Reagents. A rigid specification of purity is stated on the label of every bottle; therefore no time need be wasted in reference to a handbook. A complete price list of Towers Tested Analytical Reagents is in course of preparation.

Continental Chemical Notes

ZINC OXIDE IS NOW MANUFACTURED at the Bryn works of the Norske Zinkprodukter A.S., with a daily output of 5 tons.

SODIUM CHLORATE MANUFACTURE has been commenced by the Norwegian concern, Vadheim Elektrochemiske Fabriker, with a minimum contemplated output of 200 tons per annum.

RECENT INVESTIGATIONS by E. Caserio, at Padua, show the juice of winter cherry (alkekengi) to contain twice as much vitamin C as ripe lemon juice. The former fruit is also credited with a higher percentage of juice.

THE ATHENS CHAMBER OF COMMERCE reports increased activity in the chemical industry during the past year, the value of goods produced showing an increase of 46.5 per cent. over the 1932 figure. Marked progress occurred in particular in connection with organic dyestuffs, synthetic fertilisers, and rosin.

RUBBER CAN BE DE-POLYMERISED to give 40 to 60 per cent. solutions by treatment in suspension or solution with 10 per cent. of its weight of 53 per cent. nitric acid. A paste is first prepared by stirring 10 kilograms rubber in 90 kilograms benzole, whereupon 1 kilogram of the 53 per cent. nitric acid is stirred in and the de-polymerisation interrupted at the desired stage by neutralisation with $\frac{1}{2}$ kilogram barium carbonate. The de-polymerised rubber solution is decanted off and concentrated if necessary by evaporation. Coatings of this form of rubber are somewhat tacky, but this defect can be remedied by a partial re-polymerisation (immediately after the neutralisation stage) with antimony trichloride or phthalic acid in alcoholic solution. (German Pat. 599,405).

HEAVY WATER MANUFACTURE, to an expected daily output of half-a-kilogram, has been started by the Norsk Hydro.

A LEADING HUNGARIAN SPIRIT CONCERN has announced its intention to erect a lactic acid factory.

THE TREATMENT OF EFFLUENT from yeast extract factories is discussed by Dr. W. Kilby in the "Chemiker-Zeitung," of July 25. As particularly effective is mentioned the purifying system in operation at the Slagelse factory of the A/S de Danske Spritfabrikker (Copenhagen).

SOME INDICATION OF THE USE to which German blast furnace slag is put is provided by recently published estimates ("Chemiker-Zeitung," July 25), although these only refer to the year 1930. Hydraulic binding materials accounted for 1 million tons; road-making, permanent way foundations and concrete for 1.2 million tons; and building stone for 600,000 tons. Among the minor uses were cast paving stone (6,000 tons) and slag wool (5,000 tons).

BARIUM SULPHATE PRODUCTION is surveyed by H. Wagner and A. Jorzig in the "Farben-Zeitung" of July 28. With the aid of the ignition and fusion processes developed in recent years the salt can be produced in any desired grain size, thus filling the natural gap between heavy spar and precipitated barytes. Crystal and granular structures of special technical importance are obtainable under special conditions. The scope of application of these new forms is discussed and their properties compared with those of heavy spar and blanc fixe.

News from the Allied Industries

Non-Ferrous Metals

GERMANY'S IMPORTS OF COPPER during the first half of 1934 totalled 125,280 tons, against 87,870 tons in the second half of last year and 66,770 tons in the first half of last year. Lead imports totalled 38,650 tons, against 32,020 tons and 16,650 tons respectively; zinc imports were 76,070 tons, against 56,940 tons and 43,410 tons; and tin imports were 8,040 tons, against 8,280 tons and 6,580 tons.

Iron and Steel

THE USUAL SUMMER CONDITIONS rule in the iron and steel markets, and business in most departments has been confined to small parcels for near delivery, says the official report of the London Iron and Steel Exchange. The tone of the market remains firm, however, and there seems little likelihood of weakness developing in prices. It is expected, therefore, that when trading becomes normal after the holidays the demand will be on a satisfactory scale.

Pottery

THE RESEARCH COMMITTEE of the National Council of the Pottery Industry is co-operating with the commercial research department of an important organisation in an endeavour to elucidate some of the problems of the industry, especially in the direction of finding suitable products which could replace deleterious bodies, such, for instance, as the finding of a suitable and effective medium for the bedding of china without the addition of flint; the preparation of a body for earthenware with materials not containing flint; the ascertainment of the causes of dermatitis and the best methods for the prevention of the disease; and the feasibility of obtaining a substitute for plaster in the making of moulds. This research is apart from the inquiries and tests proceeding on the subjects of green fettling, impervious flooring, dust extraction and dust collection.

Artificial Silk

THE CONCENTRATION MOVEMENT within the French viscose group, Gillet Bernheim, has proceeded a further step through the fusion of the Soie Artificielle de Besancon and the Société Nouvelle de Soie Artificielle. The Soie Artificielle de Besancon, with a capital of 2,000,000f., is to be taken over by the Sté. Nouvelle. The share capital of the latter company will be raised to 16,000,000f., consisting of 32,000 preference shares at 100f. and 32,000 ordinary shares at 400f.

OWING TO THE INCREASING DEMANDS for rayon in Germany which, according to the German Rayon Syndicate, result to a large extent from "unjustified" purchases in advance, the syndicate has decided that the consumers shall declare the size of their stocks of rayon, etc., and their purchasing contracts before the syndicate will execute orders. This announcement is the more interesting as it had been claimed that the German rayon industry was in a position to meet all German demands. The present purchases in advance must be explained as fears of the establishment of consumption quotas or other regulations as well as fears of higher prices.

THE GERMAN IMPORT SURPLUS OF RAYON during the first six months of 1934 has increased to Rm.7,280,000 from Rm.4,590,000 during the corresponding period a year ago, while the tonnages have advanced from 994 metric tons to 1,292 metric tons. This unfavourable foreign trade position is the more noteworthy as Germany, since the end of December, has introduced a system of import quotas for rayon by which imports were reduced to 75 per cent. of the 1931 level. German imports during the six months advanced from 4,605 metric tons (valued at Rm.18,560,000) to 4,723 metric tons (valued at Rm.19,500,000). The advance was mainly due to the increase of arrivals of high-priced French rayon. Exports of rayon, on the other hand, were reduced from 3,612 metric tons (Rm.13,970,000) to 3,451 metric tons (Rm.12,220,000). German producers are working at full capacity.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

Price Changes

General.—SULPHATE OF COPPER (Manchester), £14 5s. per ton.
Coal Tar Products.—CARBOLIC ACID, crystals (Manchester), 7½d. per lb.; NAPHTHALENE, purified crystals, £10 per ton; PITCH, medium soft, 57s. 6d. per ton; TOLUOL, 90%, 2s. to 2s. 1d. per gal.; pure, 2s. 3d. to 2s. 4d.; XYLOL, commercial, 2s. 1d.; pure, 2s. 3d.
Pharmaceutical and Fine Chemicals.—MENTHOL, A.B.R. recryst. B.P., 10s. 9d. per lb.; ACETOPHENONE, 6s.

Essential Oils.—ANISE, 2s. 4½d. per lb.; BOURBON GERANIUM, 23s.; CAMPHOR, white, 105s.; CITRONELLA, Java, 1s. 5d.; CLOVE, 90/92%, English, 4s. 3d.; LEMON, 4s. 6d.; LEMON-GRASS, 4s.; PEPPERMINT, English Mitcham, 57s. 6d.; Japanese, 4s. 9d.; Wayne county, 15s. 9d.

Intermediates.—NITROBENZENE, 4½d. to 5d. per lb.; o-TOLUIDINE, 9½d. to 11s.

All other prices remain unchanged.

BUSINESS in the chemical markets is rather quiet. Quotations are being maintained and most industrial chemicals have been in satisfactory demand. The recent improved business in acetic acid has continued, and interest is being shown in acetone, ammonium chloride, formaldehyde, formic and oxalic acids. Keen competition is being experienced in regard to salamoniac. The dull items include copper sulphate, lithopone and zinc oxide. The coal tar products trade is also rather slow. The price of toluol and xylol shows slight reductions. Pharmaceutical chemicals are rather quiet, but seasonal business continues in citric and tartaric acids and cream of tartar. Benzoic acid, pyrogallie acid and vanillin have also been in demand. Interest in salicylic acid has revived.

LONDON.—There are no changes of importance to report since our last issue, prices remaining exceptionally steady. There is a slight slackening in the demand owing to the holidays. The coal tar products market remains firm and unchanged from last week.

MANCHESTER.—Trading conditions on the chemical market here during the past week have been extremely slow and little in the way of increased activity is anticipated for another two or three weeks. The causes are primarily seasonal and the chemical trade as well as most other branches normally regard this period as the duller of the year. The difficulties have been added to, to some extent, by the prevailing financial crisis in Germany and its direct reactions on certain of the chemical-using industries in Lancashire. Deliveries against contracts this week have been at an extremely low level, and, taking the market as a whole, the few new orders that have been booked have been relatively unimportant. In many respects business has been insufficient to furnish a real test of values, but the undertone in most departments remains steady and there has been little or no change to report. Trade in most descriptions of tar products has continued on restricted lines.

SCOTLAND.—The Scottish holidays have only this week concluded so that business is very quiet.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. LONDON: Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech., 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—Commercial granulated, £25 10s. per ton; crystal, £26 10s.; powdered, £27 10s.; extra finely powdered, £29 10s. packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots.

ACID, CHROMIC.—10½d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—9d. per lb. less 5%.

ACID, CRESYLIC.—97/99%, 1s. 8d. to 1s. 9d. per gal.; 98/100%, 2s. to 2s. 2d.

ACID, FORMIC.—LONDON: £43 10s. per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £49 to £53 ex store.

ACID, SULPHURIC.—SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—LONDON: 1s. per lb. SCOTLAND: B.P. crystals, 11d., carriage paid. MANCHESTER: 1s. 0½d.

ALUM.—SCOTLAND: Lump potash, £8 10s. per ton ex store.

ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—LONDON: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £18 to £19. (See also Salamoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salamoniac.)

ANTIMONY OXIDE.—SCOTLAND: Spot, £26 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON: £16 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £23 ex wharf. MANCHESTER: White powdered Cornish, £21 ex store.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—£11 per ton.

BARYTES.—£6 10s. to £8 per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot, 35/37%, £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 in 5/6 cwt. casks for contracts over 1934/1935.

BORAX, COMMERCIAL.—Granulated, £14 10s. per ton; crystal, £15 10s.; powdered, £16; finely powdered, £17; packed in 1-cwt. bags, carriage paid home to buyer's premises within the United Kingdom in 1-ton lots.

CADMIUM SULPHIDE.—2s. 7d. to 2s. 11d.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—3½d. to 5d. per lb. LONDON: 4½d. to 5d.

CARBON TETRACHLORIDE.—£41 to £46 per ton, drums extra.

CHROMIUM OXIDE.—10½d. per lb., according to quantity d/d U.K.; green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3½d. per lb.; liquor, £19 10s. per ton d/d.

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—LONDON: £4 2s. 6d. per cwt.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £26 per ton. SCOTLAND: 40%, £28 ex store.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £34 10s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER: White, £34; brown, £31 10s.

LEAD, NITRATE.—£28 per ton.

LEAD, RED.—SCOTLAND: £25 10s. to £28 per ton; d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £37 10s.

LITHOPONE.—30%, £17 10s. to £18 per ton.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

METHYLATED SPIRIT.—61 O.P. Industrial, 1s. 6d. to 2s. 1d. per gal. Pyridinised industrial, 1s. 8d. to 2s. 3d. Mineralised, 2s. 7d. to 3s. 1d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.

NICKEL SULPHATE.—£49 per ton d/d.

PHENOL.—8½d. to 9d. per lb. without engagement.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £38.

POTASSIUM BICROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5½d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99½/100%, powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9½d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: Commercial, 8½d.; B.P., 9½d.

POTASSIUM PRUSSIAN.—LONDON: 8½d. to 8¾d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d. to 8¾d.

RUPRON (MINERAL RUBBER).—£15 10s. per ton.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.

SODA ASH.—56% spot, £5 15s. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid 76/77° spot, £13 17s. 6d. per ton d/d station in bags. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks. Solid 76/77°, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£22 per ton. LONDON: £23.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. net for spot lots and 4d. per lb. with discounts for contract quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts.

SODIUM BISULPHITE POWDER.—60/62%, £18 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£32 per ton.

SODIUM CHROMATE.—4d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.

SODIUM META SILICATE.—£16 per ton, d/d U.K. in cwt. bags.

SODIUM NITRATE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.

SODIUM PERBORATE.—LONDON: 10d. per lb.

SODIUM PHOSPHATE.—£13 per ton.

SODIUM PRUSSIAN.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5½d. ex store. MANCHESTER: 4¾d. to 5¾d.

SULPHUR.—£9 15s. to £10 per ton.

SODIUM SILICATE.—140° Tw. Spot £8 per ton d/d station, returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d SCOTLAND: English material £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 5s.

SODIUM SULPHIDE.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d., d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8 2s. 6d.

SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.

SULPHATE OF COPPER.—MANCHESTER: £14 5s. per ton f.o.b.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 3s. 11d. to 4s. 1d. per lb.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON and SCOTLAND: £12 per ton.

ZINC SULPHIDE.—11d. to 1s. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 8½d. to 8¾d. per lb.; crude, 60's, to 2s. 2½d. per gal. MANCHESTER: Crystals, 7¾d. per lb.; crude, 1s. 11d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

ACID, CRESYLIC.—90/100%, 1s. 8d. to 2s. 3d. per gal.; pale 98%, 1s. 6d. to 1s. 7d.; according to specification. LONDON: 98/100%, 1s. 6d.; dark, 95/97½%, 1s. 3d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.

BENZOL.—At works, crude, 9d. to 9½d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d.

CREOSOTE.—B.S.I. Specification standard, 4d. to 4½d. per gal. f.o.r. Home, 3½d. d/d. LONDON: 3½d. f.o.r. North; 4d. LONDON. MANCHESTER: 3½d. to 4½d. SCOTLAND: Specification oils, 4d.; washed oil, 4½d. to 4¾d.; light, 4½d.; heavy, 4½d. to 4¾d.

NAPHTHA.—Solvent, 90/100%, 1s. 6d. to 1s. 7d. per gal.; 95/100%, 1s. 7d. to 1s. 8d.; 99%, 11d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/100%, 1s. 3d. to 1s. 3½d.; 90/100%, 11d. to 1s. 2d.

NAPHTHALENE.—Purified crystals, £10 per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

PITCH.—Medium soft, 57s. 6d. per ton, in bulk, at makers' works. LONDON: £3 to £3 1s. per ton f.o.b. East Coast port for next season's delivery.

PYRIDINE.—90/140, 7s. 6d. to 9s. per gal.; 90/180, 2s. 3d. per gal.

TOLUOL.—90%, 2s. to 2s. 1 per gal.; pure, 2s. 3d. to 2s. 4d.

XYLOL.—Commercial, 2s. 1d. per gal.; pure, 2s. 3d.

Intermediates and Dyes

ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID, NAPHTHIONIC.—1s. 8d. per lb.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100%.

ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb., 100% d/d buyer's works.

BENZIDINE HCL.—2s. 5d. per lb.

p-CRESOL 34.5° C.—2s. per lb. in ton lots.

m-CRESOL 98/100%.—2s. 3d. per lb. in ton lots.

DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8d. per lb.

DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 01½d.

DINITROCHLOROBENZENE, SOLID.—£72 per ton.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-NAPHTHOL.—Spot, £78 15s. per ton in paper bags.

α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.

β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works.

o-NITRANILINE.—3s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 7d. per lb., d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb., d/d buyer's works.

NITROBENZENE.—Spot, 4½d. to 5d. per lb.; 5-cwt. lots, drums extra.

NITRONAPHTHALENE.—9d. per lb.; P.G., 1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—9½d. to 11d. per lb.

p-TOLUIDINE.—1s. 11d. per lb.

Nitrogen Fertilisers

The following prices for the chief nitrogen fertilisers apply for all prompt business:—

SULPHATE OF AMMONIA.—Home: £7 5s. per ton delivered in 6-ton lots to farmer's nearest station. Export: Nominal, £5 17s. 6d. per ton f.o.b. U.K. ports in single bags.

CYANAMIDE.—£7 5s. per ton carriage paid to any railway station in Great Britain in lots of 4 tons and over.

NITRATE OF SODA.—£7 18s. 6d. per ton delivered in 6-ton lots to farmer's nearest station.

NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to farmer's nearest station.

CONCENTRATED COMPLETE FERTILISERS.—£10 15s. to £11 6s. per ton according to percentage of constituents.

NITROGEN PHOSPHATE FERTILISERS.—£10 5s. to £13 15s. per ton according to percentage of constituents.

(Latest Oil Prices will be found on page 113.)

Inventions in the Chemical Industry

Patent Specifications and Applications

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Granulating Waxes

Wax-like chlorinated hydrocarbons mixed or not with other substances are formed into small pieces of arbitrary size and shape, e.g. scales or platelets, by allowing the molten material to solidify as a film on a cool surface such as a rotating drum, and breaking up the film. See Specification No. 28,772 of I. G. Farbenindustrie.

Catalysts

Catalysts for the hydration of olefines comprise ferric metaphosphate together with the metaphosphate of a divalent metal such as magnesium, cadmium, alkaline earth metals, ferrous iron, copper, or nickel. The proportions may be one or two molecules of ferric metaphosphate to one molecule of the divalent metal metaphosphate. In an example, one molecular proportion each of ferrous oxalate and ferric oxide are treated with 8 molecular proportions of aqueous orthophosphoric acid, and the mixture is evaporated to dryness and heated up to 300° C. See Specification No. 27,703 of G. F. Horsley and Imperial Chemical Industries, Ltd.

Delustring Artificial Silk

Delustred artificial silk obtained for example from viscose, cuprammonium, cellulose acetate or cellulose nitrate, contains both titanium dioxide and chlorinated diphenyl. The chlorinated diphenyl is stated to eliminate the metallic appearance of artificial silk delustred by means of titanium dioxide. The delustrants may be used in amounts, e.g., between 0.1 and 5.0 per cent. of titanium dioxide and between 0.5 and 15 per cent. of diphenyl, calculated on the weight of dry yarn, and may be distributed throughout the solution by means of a dispersing agent, prior to spinning. See Specification No. 384,224 of Viscose Co.

Motor Fuels

Liquid hydrocarbon fuels for internal-combustion engines are stabilised against formation of gum by incorporating therein a dihydric or trihydric phenol such as catechol, hydroquinone or pyrogallol in relatively small proportion, e.g., 0.005—1 per cent. by weight, as a solution in cresol. A 5—15 per cent. solution of the dihydric or trihydric phenol in the cresol may be employed. The fuel may first be distilled into a light and a heavy fraction which are separately refined by known methods, the gum-stabilising agent being added to the light fraction and the fractions being mixed together. See Specification No. 24,145 of Anglo-Persian Oil Co., Ltd.

Waxes and Wax-like Substance

Waxes and wax-like substances are formed into beads, balls, scales, platelets, or other small pieces by processes involving melting and resolidification. Thus the molten material is forced or allowed to fall in thin streams from a height of 15—30 metres whereby balls or beads are formed; the height may be reduced by rapidly cooling the falling streams as by a counter-current of cold air, or by causing them to fall into water or other non-solvent liquid. Scales or platelets may be obtained by forming a film on a cold rotating drum or other surface and breaking up the film. Substances treated include carnauba, candelilla, and montan waxes, mixed or not with paraffin wax, ozokerite, or other customary addition; and wax-like chlorinated hydrocarbons alone or mixed with other substances. See Specification No. 18,433 of I. G. Farbenindustrie.

Viscose Artificial Silk

Viscose artificial silk has its tensile properties enhanced by incorporating in the viscose to be spun, an aromatic derivative of an aliphatic alcohol the aromatic group replacing a hydrogen atom other than that of the hydroxy group. Examples of such derivatives are anisyl alcohol, benzyl alcohol, and phenyl ethyl alcohol, and the amount added is preferably from 15 to 30 per cent. of the weight of the cellulose present. The derivative is not necessarily soluble in the viscose, for example, benzyl alcohol may be added as an emulsion or as the sodium salt which is soluble. In an example, viscose is prepared, filtered, and aged, and within 24 hours of the spinning time, 1.5 per cent. by weight of benzyl alcohol is thoroughly emulsified in the solution. The viscose is then spun under normal conditions. The yarn shows an increase in wet strength of 20 per cent., in dry strength of 5 per cent., and in dry extensibility of 15 per cent. See Specification 34,696 of Viscose Co.

Hydrochloric Acid

Aqueous hydrochloric acid is obtained by absorbing gaseous hydrochloric acid in boiling water. An odourless acid can thereby be obtained from the gases from organic chlorinations and like sources the organic impurities being removed by the steam produced. The gases may be passed in counter-current to a stream of water having a temperature of 100—110° C. in a packed tower which may be insulated against loss of heat. The heat generated in the reaction may be supplemented if necessary by the introduction of live steam. The incoming water may be preheated by being brought into indirect contact with the effluent gases and vapours and/or the final hot acid solution. The aqueous acid which is of about 20 per cent. strength may be brought up to commercial strength after cooling by absorption in the ordinary manner of further gaseous hydrogen chloride from an inorganic source. An example of the treatment of gaseous hydrochloric acid from the chlorination of benzene is given. See Specification No. 28,013 of J. P. Baxter and Imperial Chemical Industries, Ltd.

Complete Specifications Open to Public Inspection

LEAD CHROMATE and substances containing lead chromate, manufacture.—Harshaw Chemical Co. Jan. 17, 1933. 23534/33.
REFINING OF LEAD.—G. K. Williams. Nov. 25, 1932. 32315/33.
FINELY DIVIDED CALCIUM CARBONATE and method of producing it.—Pittsburgh Plate Glass Co. Jan. 21, 1933. 148/34.
1:4-DIAMINOANTHRAQUINONES, manufacture.—Soc. of Chemical Industry in Basle. Jan. 18, 1933. 1683/34.
MOLYNUCLEAR PHENOLS, manufacture.—E. I. du Pont de Nemours and Co. Jan. 19, 1933. 1800/34.
LIQUID HYDROCARBONS, stabilisation.—E. I. du Pont de Nemours and Co. Jan. 20, 1933. 2173/34.
AZO DYESTUFFS and their manufacture.—E. I. du Pont de Nemours and Co. Jan. 21, 1933. 2174/34.
CONDENSATION PRODUCTS FROM PHLOROGLUCINOL and aromatic amines, manufacture.—I. G. Farbenindustrie. Jan. 20, 1933. 2181/34.
CONVERSION PRODUCTS OF ETHYLENES, manufacture.—I. G. Farbenindustrie. Jan. 20, 1933. 2226/34.

Specifications Accepted with Dates of Application

PURE LECITHIN, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 21, 1932. 413,714.
ANTHRAQUINONE DYESTUFFS.—Imperial Chemical Industries, Ltd., S. Ellingworth, N. H. Haddock, F. Lodge, and C. H. Lumsden. Dec. 14, 1932. 413,658.
RESINOUS COMPOSITIONS, manufacture and application.—A. A. Drummond, H. H. Morgan and Imperial Chemical Industries, Ltd. Dec. 20, 1932. 413,718.
REFINING HYDROCARBONS, process.—Improved Hydro-Carbon Processes, Ltd. Dec. 20, 1932. 413,719.
COPPER SULPHATE, manufacture.—M. Serciron. Sept. 1, 1932. 413,721.
OXYCHLORIDES OF COPPER and of antieryptogamic products containing them, manufacture.—M. Serciron. Sept. 1, 1932. 413,722.
ACID SOLUTIONS, preparation.—I. G. Farbenindustrie. Feb. 23, 1932. 413,674.
HYDROCARBON PRODUCTS, in particular lubricating oils.—J. Y. Johnson (I. G. Farbenindustrie). Jan. 13, 1933. 413,637.
NITRILES, manufacture.—Imperial Chemical Industries, Ltd., R. P. Linstead, and A. R. Lowe. Jan. 13, 1933. 413,639.
CONDENSATION PRODUCTS from hydroxylated cyclic compounds and acetylene, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Jan. 14, 1933. 413,640.
PROOFING TEXTILE MATERIALS against moulds and fungi.—C. R. N. Strouts, and Imperial Chemical Industries, Ltd. Jan. 17, 1933. 413,648.
OIL-SOLUBLE METAL SALTS of organic acids, manufacture.—Resinous Products and Chemical Co. Jan. 23, 1932. 413,728.
KETENE, process of and apparatus for making.—Carbide and Carbon Chemicals Corporation.—Feb. 5, 1932. 413,709.
NON-TOXIC DIAMINO COMPOUNDS of arsenobenzene, process for making.—S. Kielbasinski. Jan. 26, 1933. 413,753.
ALDEHYDES, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Jan. 26, 1933. 413,754.
EMULSIONS.—C. W. Richards, H. Dodd, and Imperial Chemical Industries, Ltd. Jan. 26, 1933. 413,756.
FAST DYEINGS, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Feb. 6, 1933. 413,772.

CHROMIFEROUS DYESTUFFS, manufacture.—Soc. of Chemical Industry in Basle. Feb. 20, 1932. 413,788.
 OXIDES OF NITROGEN, absorption and recovery.—H. Frischer. April 22, 1932. 413,828.
 AMMONIUM SULPHATE NITRATE, process for making.—Gewerkschaft Victor. June 23, 1932. 413,863.
 BASIC MAGNESIUM CARBONATE, processes for making.—American Zinc, Lead and Smelting Co. July 12, 1932. 413,869.
 CONTINUOUS DISTILLATION OF HYDROCARBONS or hydrocarbon products, process and apparatus for effecting.—A. Wagner. Aug. 1, 1932. 413,877.
 TITANIUM PIGMENTS, production.—Titan Co., Inc. Oct. 29, 1932. 413,915.

Applications for Patents

(July 19 to 25 inclusive).

PLASTIC COMPOSITIONS.—A. E. Bond. 21414.
 DYEING, ETC., TEXTILE FIBRES.—J. Brandwood. 21713.
 AZO DYESTUFFS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21336.
 DYESTUFFS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21337.
 PYRENE COMPOUNDS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21338.
 WATER INSOLUBLE AZO DYESTUFFS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21547.
 AMINO COMPOUNDS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21548.
 TREATING DYED TEXTILE GOODS.—A. Carpmal (I. G. Farbenindustrie). 21549.
 STABLE PREPARATIONS containing alkali hydrosulphides, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21550.
 HETEROCYCLIC AMINO COMPOUNDS, manufacture.—A. Carpmal (I. G. Farbenindustrie). 21551.
 AQUEOUS, POSITIVELY-CHARGED EMULSIONS, production.—Chemische Fabrik Pfersee Ges. (Germany, Sept. 28, '33.) 21487.
 ZINC WHITE, production.—H. E. Coley. 21270.
 CELLULOSE-COATED MATERIALS.—E. I. du Pont de Nemours and Co. (United States, July 19, '33.) 21153.
 HYDROCYANIC ACID, manufacture.—E. I. du Pont de Nemours and Co. (United States, July 21, '33.) 21571.
 EMULSIONS.—E. I. du Pont de Nemours and Co. and H. J. Barrett. 21574.
 COUNTERACTING ABSORPTION of oxygen, etc., of tall oil soap.—A. Hellström. (Sweden, July 31, '33.) 21678.
 POLYMETHINE DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, July 21, '33.) 21476.
 POLYMETHINE DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, July 13.) 21477. (Cognate with 21476.)
 PHOTOGRAPHIC SILVER-HALIDE EMULSIONS.—I. G. Farbenindustrie. (Germany, July 22, '33.) 21478.
 PHOTOGRAPHIC SILVER-HALIDE EMULSIONS.—I. G. Farbenindustrie. (Germany, Nov. 14, '33.) 21479. (Cognate with 21478.)
 PHOTOGRAPHIC SILVER-HALIDE EMULSIONS.—I. G. Farbenindustrie. (Germany, June 9.) 21480. (Cognate with 21478.)
 CONVERSION PRODUCTS of natural resins, manufacture.—I. G. Farbenindustrie. (Germany, July 24, '33.) 21552.
 MONOAZO DYESTUFFS, manufacture.—I. G. Farbenindustrie. (Germany, July 25, '33.) 21789.
 DYESTUFFS.—Imperial Chemical Industries, Ltd., and A. Riley. 21151, 21152.
 AZO DYESTUFFS for leather.—Imperial Chemical Industries, Ltd., and M. Mendoza. 21286, 21288.
 NITRILES, manufacture.—Imperial Chemical Industries, Ltd., and W. O. Jones. 21287.
 AZO DYESTUFFS.—Imperial Chemical Industries, Ltd., and M. Mendoza. 21573.
 CATALYTIC DESTRUCTIVE HYDROGENATION of solid carbonaceous materials.—International Hydrogenation Patents Co., Ltd. (Germany, Aug. 29, '33.) 21601.
 ARTIFICIAL SILK, ETC., manufacture.—H. W. K. Jennings (Glan-zstoff-Courtauld Ges.). 21413.
 SINTERING AND FUSING QUARTZ.—J. Y. Johnson (I. G. Farbenindustrie). 21132.
 DYESTUFFS.—J. Y. Johnson (I. G. Farbenindustrie). 21133.
 DYESTUFF COMPOSITIONS.—J. Y. Johnson (I. G. Farbenindustrie). 21134, 21135, 21136.
 FILLING CONTAINERS with liquids, apparatus.—J. Y. Johnson (I. G. Farbenindustrie). 21279.
 ELECTROLYTIC MANUFACTURE of chromium.—J. Y. Johnson (I. G. Farbenindustrie). 21280.
 DEGREASING ANIMAL HIDES, ETC.—J. Y. Johnson (I. G. Farbenindustrie). 21498.
 AZO DYESTUFFS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 21499, 21502.
 NITROGENOUS DERIVATIVES of chrysene, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 21500.
 DISAZO DYESTUFFS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 21501.

COLOURED COMPOUNDS, manufacture.—J. Y. Johnson (I. G. Farbenindustrie). 21770.
 THERAPEUTICALLY-ACTIVE TETRAZOLE DERIVATIVES, production.—Enoll Akt.-Ges., Chemische Fabriken and K. F. Schmidt. (Germany, July 22, '33.) 21521.
 PRECIPITATION OF MATERIALS from colloidal solutions.—Kodak, Ltd. (France, Aug. 22, '33.) 21418.
 AMMONIUM SULPHATE, manufacture.—R. Lessing. 21630.
 FLUORESCENT MATERIAL.—L. A. Levy and D. W. West. 21333.
 FOOD PRODUCTS.—A. H. Marfurt. 21420.
 ALKALI PERBORATES, ETC., production.—Naamlooze Vennootschap Industriele Maatschappij voorheen Noury and van der Laude. (Holland, Aug. 9, '33.) 21392.
 LITHOPONE.—New Jersey Zinc Co. (United States, June 22.) 21656.
 SEPARATING SULPHUR from gases.—Dr. C. Otto and Co., Ges. (Germany, July 25, '33.) 21760.
 SEPARATING SULPHUR from gases.—Dr. C. Otto and Co., Ges. (Germany, Dec. 5, '33.) 21761.
 HYDROGENATING GASES, purification.—H. E. Potts (International Hydrogenation Patents Co., Ltd.) 21362.
 HYDROGEN, purification.—H. E. Potts (International Hydrogenation Patents Co., Ltd.) 21363.
 ACETIC ANHYDRIDE, production.—H. E. Potts (Shawinigan Chemicals, Ltd.). 21708.
 AZO DYESTUFFS.—F. L. Rose 21573.
 CATALYTIC AGENTS, preparation, etc.—N. M. Simpson. 21668.
 GRIGNARD REAGENT, method of preparing.—A. Leigh-Smith. 21491.
 PREPARING ETHYLENE GLYCOL from dichlorethane.—Soc. Carbochimique Soc. Anon. (France, Aug. 28, '33.) 21268.
 CARBAZOLE DERIVATIVES, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, July 20, '33.) 21272.
 DERIVATIVES OF NUCLEOTIDES, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, July 21, '33.) 21273.
 CONDENSATION PRODUCTS containing nitrogen, manufacture.—Soc. of Chemical Industry in Basle. (Switzerland, July 21, '33.) 21474.
 METALLIC CARBONYLS, production.—A. H. Stevens (Catalyst Research Corporation). 21425.
 TESTING YARNS, etc., for looseness of dye therein.—C. O. M. Steward. 21582.
 ALKALISING LIQUIDS.—W. J. Tennant (Henkel et Cie, Ges.). 21788.
 SEPARATING SUSPENDED SOLIDS from liquid.—W. W. Triggs (General Zeolite Co.). 21674.
 ORGANIC ARSENIC COMPOUNDS.—W. W. Triggs (Parke, Davis and Co.). 21806.
 ACETYL SALICYLIC ACID, utilisation.—M. Wodlinger. 21419.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Australia.—A firm of manufacturers' agents in Melbourne with offices in London desires to represent United Kingdom manufacturers of chemists' sundries, on a basis to be arranged, for the whole of Australia. (Ref. No. 95.)

Canada.—A manufacturers' agent at Westmount, P.Q., desires to represent United Kingdom manufacturers of (a) pumping plant, particularly special equipment for oil, acid, etc.; (b) electrical equipment (recently developed equipment and new appliances using electrical energy); (c) electrical heating equipment, such as furnaces, industrial heaters, etc.; (d) primary and secondary storage batteries; (e) electrical condensers; (f) electrical or oxy-acetylene welding equipment and supplies; (g) pulp and paper mill equipment, and (h) special steels and alloy steels, in the Provinces of Quebec and Ontario, presumably on a commission basis. (Ref. No. 101.)

South Africa.—A firm of manufacturers' agents in Cape Town with sub-agents throughout the Union desires to represent United Kingdom manufacturers of glass bottles for manufacturing chemists, on a commission basis. (Ref. No. 107.)

Dutch East Indies.—A gentleman with ten years' business experience in the Netherland East Indies proposes to establish himself as a commission agent in Holland for plastics of every description, patent medicines, etc., and to deal particularly with firms in Holland having branches in the Dutch East Indies. (Ref. No. 116.)

Poland.—An agent in Warsaw wishes to secure the representation of United Kingdom manufacturers of pharmaceutical chemicals. (Ref. No. 117.)

Portugal.—An agent established at Lisbon wishes to obtain the representation of United Kingdom manufacturers of medicinal food-stuffs and pharmaceutical specialities. (Ref. No. 118.)

From Week to Week

MR. S. C. E. LLOYD has been appointed chairman of the Zine Manufacturing Company, Ltd.

MR. G. W. PARTRIDGE, M.Inst.C.E., M.Inst.E.E., has been appointed a director of the Staveley Coal and Iron Co., Ltd., in place of the late Mr. Frank Tatlow.

A £3,000 BROOCH which Lady Melchett missed after the Royal Garden Party on July 26, has been found in the Palace grounds by one of the guests. The identity of the finder is not yet known.

LITTLEMILL DISTILLERY, Bowling, which has been on the market for a number of years, is likely to be sold and may become a chemical factory. Negotiations are proceeding and it is stated that it will only be a matter of weeks till the factory will be in full swing.

NOTICE WAS GIVEN in the "London Gazette" of July 27 of the voluntary winding up of the Bugle China Clay Co., Ltd., and the appointment of Mr. H. Hey, of 53 King Street, Manchester, as liquidator.

MR. JOHN W. BIGGART, of Rossarden, Kilmacoll, and Woodbine, Bridge of Weir, and of 29 Cathcart Street, Greenock, analytical chemist, who died on March 27 last, left personal estate in Great Britain to the value of £37,204.

AN ABRIDGED PRICE LIST of general laboratory apparatus has been issued by Poulten, Selfe and Lee, Ltd., of 163 Bow Road, London. This list of over 100 pages is intended to serve as a guide to their activities.

AT BIRMINGHAM POLICE COURT on July 27 the Holt Chromium Plating Co., Ltd., was fined £2 7s. 6d. for employing a boy of 13, contrary to regulations. It was stated in defence that the boy was employed out of sympathy. The firm did not want him and were ignorant of the regulations.

THE CHEMICAL MANUFACTURER'S BUSINESS carried on by the United Kingdom Chemical Co., at Netherlee, Glasgow, of which the late Mr. W. H. Mitchell was the sole partner, has been transferred to Mr. W. D. Haddow, who has been in the employment of the firm for some years.

ENGLISH FRIENDS WILL CONGRATULATE Professor Domenico Marotta on his appointment as chief of the Italian Chemical Laboratory of Public Health. Those who had the good fortune to attend the triennial excursions of the Italian Chemical Societies will be aware of the great ability he has displayed as a social organiser; particularly they remember the fascinating expedition he led around Sicily.

THE PRINCIPAL of the Wade Deacon Grammar School, Widnes, announced on July 28 that in future the Muspratt French Travelling Scholarships will be discontinued under the Muspratt name. Mr. R. Robinson, M.P., for the Widnes division had decided to continue the scholarships. The Muspratt name has been connected with Widnes for nearly a century, and was originally identified with Widnes by Mr. James Muspratt, founder of the heavy chemical industry, who made it the centre of his enterprise.

PROMPT ACTION BY EMPLOYEES prevented a fire in an oil tank from assuming serious dimensions at Camperdown Refinery, Dundee, belonging to William Briggs & Sons, Ltd. Extinguishers were brought into operation on the open tank, which contained 500 gallons of light oil. The oil is believed to have caught fire through a spark from a pipe which was being welded nearby. Only a small quantity of the oil was destroyed, but the tank was in close proximity to one of the large crude oil tanks of 1,000,000 gallons capacity.

THE AMERICAN SECTION of the Society of Chemical Industry announces the election of the following officers to serve for the year ending June 1, 1935:—Chairman, Robert J. Moore; vice-chairman, W. D. Turner; hon. secretary, Foster D. Snell; hon. treasurer, J. W. H. Randall. In addition, five new members were elected to the Executive Committee to take the place of retiring members. Those newly elected are Lincoln T. Work, Wallace P. Cohoe, Albert E. Marshall, James G. Vail and Charles A. Lunn.

THE SCOTTISH COUNCIL of the Amalgamated Society of Dyers and Kindred Workers has decided to put the following proposals before the employers: minimum base rates for men to be advanced from 30s. 3d. to 34s., and for women, from 18s. to 21s. per 48 hour week. The employers are endeavouring to secure adherence to the official price list by all employees in the dyeing industry. It is held that by so doing, they will not only stimulate trade and the textile industry generally, but that this will also aid in increasing wages.

SATISFACTORY PRELIMINARY TESTS of an oil suitable for diesel engines have been made by Low Temperature Carbonisation, Ltd. Colonel W. A. Bristow, the chairman of the company, made this announcement at a stockholders' meeting, held in London on July 31. He regarded this matter as one of considerable importance not only to the company but to the coal industry. People in this country had little knowledge of the magnitude of this new development and the manufacture of diesel oil from coal was going to be a large factor in the salvation of the coal industry.

MR. JOHN KEE MACGOWAN has been appointed a director of British Tin Investment Corporation, Ltd.

A FIRE which broke out in the sack mills owned by Lewis Brooks and Co., of Stratford, on July 27, gutted the premises.

THE FIRM OF DUNDALK CHEMICALS, LTD., Dundalk, Co. Louth, has been elected to membership of the Federation of Irish Free State Industries.

NINE ACCIDENTS WERE REPORTED in the chemical and allied industries in the Irish Free State in 1933, as against eight in the previous year, states the official report of the Department of Industry and Commerce of that country.

AN ACCIDENT OCCURRED at the brickmaking plant of the Pumpherson Oil Co. on July 29. Owing to a hitch in the machinery lime forced its way out of a boiler, burning Thomas Wynne on the face and chest. Two other workmen also received slight injuries.

MR. W. J. BEARDSLEY, M.P.S., chairman and managing director of National Drug Industries, Ltd., announced at a meeting on July 26, that the rearrangement of the sales organisation was now completed, and that this section of the business would receive the directors' careful attention during the coming year.

NEW COMPANIES IN THE CHEMICAL INDUSTRY registered at Somerset House during the first half of 1934 totalled 297, with an aggregate capital of £1,083,100. According to the half yearly statistical report issued by Jordan and Sons, Ltd., company registration agents, these new companies comprised three public companies, with a total capital of £236,000, and 294 private companies, with an aggregate capital of £847,100.

THE 10TH EDITION of the "Chemical Guide-Book" has just been published by Chemical Markets, Inc., of New York. It extends to over 655 pages, and is divided into four parts. The first part is an alphabetical catalogue of the leading chemical firms in the United States; the second is a buying guide and directory of chemical products, giving names and addresses of sources of supply, shipping regulations, tariffs, etc.; the third part is a geographical directory of chemical and allied industries, and the fourth consists of chemical statistics, prices, etc.

AN ARRANGEMENT HAS BEEN MADE whereby the Rubber Regenerating Co., Ltd., of Trafford Park, Manchester, is to pass entirely into British ownership. This company has for many years been one of the largest manufacturers of reclaimed rubber in this country and has also acted as European agent for the Naugatuck Chemical Co., of the United States, for chemicals used in the rubber industry. The company is to continue its business under the same executive management and will also continue its chemical business with the Naugatuck Chemical Co. An interesting new departure is the acquisition by the Rubber Regenerating Co., Ltd., of the "Solvent" reclaim patents and business of Thames Hard Rubber Corporation, Ltd., and Kaycee, Ltd., in Great Britain. "Solvent" reclaim known as "Kaycee" reclaim has been developed by the Thames Hard Rubber Corporation, Ltd., during the past two years and has established a strong position for itself in the market, not so much as a competitor of Alkali reclaims as in new fields, where conservation of the cotton in waste tyres is an advantage. The demand has been such that immediate steps are being taken to carry out the manufacture of Solvent reclaims in the Trafford Park Works of the Rubber Regenerating Co., instead of at the Belvedere Plant of Thames Hard Rubber Corporation, Ltd. This latter plant which is also to be acquired by Rubber Regenerating Co., Ltd., will be devoted to the manufacture of solvent used in the Kaycee process and to the development of certain new lines of rubber chemicals which the company control.

Latest Oil Prices

LONDON, Aug. 1.—LINSEED OIL was quiet. Spot, £22 (small quantities 30s. extra); Aug., £20 10s.; Sept.-Dec., £21; Jan.-April, £20 10s., naked. SOYA BEAN OIL was steady. Oriental (bulk), Aug.-Sept. shipment, £15 per ton. RAPE OIL was quiet. Crude extracted, £27; technical refined, £28 10s., naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £12 10s.; refined common edible, £15 10s.; and deodorised, £17, naked, ex mill (small lots 30s. extra). TURPENTINE was steady. American, spot, 41s. 3d. per cwt.

HULL.—LINSEED OIL, spot, quoted £21 5s. per ton; July-Aug., £20 17s. 6d.; Sept.-Dec., £21; Jan.-April, £20 15s., naked. COTTON OIL, Egyptian, crude, spot, £12 10s.; edible refined, spot, £14 5s.; technical, spot, £14 5s.; deodorised, £16 5s., naked. PALM KERNEL OIL, crude, f.m.q., spot, £13 10s., naked. GROUNDNUT OIL, extracted, spot, £19 10s.; deodorised, £23 10s. RAPE OIL, extracted, spot, £26; refined, £27 10s. SOYA OIL, extracted, spot, £16 10s.; deodorised, £19 10s. per ton. COD OIL (industrial), 25s. per cwt. CASTOR OIL, pharmaceutical, 36s.; first, 31s.; second, 28s. per cwt. TURPENTINE, American, spot, 43s. 3d. per cwt.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., patent and trade mark agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade marks can be lodged up to August 25, 1934.

Mursyn. 551,128. Class 1. Synthetic enamels in the nature of paints. Murray & Jones, Ltd., 22 Meredith Street, Plaistow, London, E.13. May 15, 1934.

Starit. 551,894. Class 1. Preparations for the prevention and removal of boiler scale. Starit, Ltd., 35-36 Rathbone Place, London, W.1. June 13, 1934.

Surama. 552,031. Class 1. Paint and distemper. Darby Brothers (Bromley), Ltd., Bromley North Station, Bromley, Kent, June 19, 1934.

Cymag. 550,628. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes, but not including soaps. Imperial Chemical Industries, Ltd., Imperial Chemical House, Millbank, London, S.W.1. April 24, 1934.

Company News

English Velvet & Cord Dyers' Association.—Payment at the rate of 5 per cent. per annum on cumulative preference shares is announced. Consideration for dividend on ordinary is deferred until result of year's trading has been ascertained.

Sheffield Pure Ice & Cold Storage.—The divisible amount is £9,152, including amount brought in and after writing off depreciation at usual rate and payment of interim of 5 per cent., less tax, the directors recommend a final dividend of 5 per cent., less tax, leaving £4,667 to be carried forward.

New Companies Registered

Anglo-Italian Sulphur Corporation, Ltd.—Registered July 26. Nominal capital £45,000 in 10s. shares. To acquire sulphur mines and quarries, or sulphur mining rights and concessions in the Island of Nisiro or elsewhere, to prepare for market sulphur ore and other products, etc. Directors: Sir James MacKenna, 23 Windsor Court, W.2. E. T. Cobbett, N. D. Grundy, Cav. E. Coffino.

British Commercial Gases, Ltd., 34 Victoria Street, S.W.1.—Registered July 25. Nominal capital £10,000 in £1 shares. Manufacturers of gases and chemicals, carbide of calcium and oxygen, etc. Directors: Chas. H. Bingham, junr., "Hillsborough," Searchwood Road, Upper Warlingham, Surrey, and P. Baker.

Leach & Son (Norfolk), Ltd.—Registered July 30. Nominal capital £15,000 in £1 shares. Manufacturers, refiners and blenders of and dealers in paints, pigments, red and other lead cements, dyes, colours, etc. Directors: J. B. A. Leach, "Amalfi," Bluebell Road, Eaton, Norwich, J. Starling and Mrs. V. M. Leach.

Books Received

Chemical Guide Book, 1934. New York. William Haynes. Pp. 695. \$2.

Official Publications

Economic Conditions in France. Dated June, 1934. Report by Sir Robert Cahill, Commercial Counsellor, H.M. Embassy, Paris. London H.M. Stationery Office. Pp. 723. 7s.

Economic Conditions in Germany. Dated June, 1934. Report by J. W. F. Thelwall, C.M.G., M.C., Commercial Counsellor to H.M. Embassy in Berlin. London, H.M. Stationery Office. Pp. 228. 3s. 6d.

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